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ABSTRACT

This volume contains the proceedings of the third joint symposium of the Association of Research Libraries (ARL) and the Association of American University Presses (AAUP). The following papers were presented: "Opening Remarks for the ARL-AAUP Symposium" (Lisa Freeman); the keynote address, "We're All in this Together, Aren't We?" (Bruce Sterling); "The Library as Mind" (D. Kaye Gapen); "The Virtual Library: an Index Whose Time Has Passed" (James J. O'Donnell); "Historical Visions and Modern Revisions of Virtual Knowledge" (Eugene Vance); "Digital Preservation, Restoration, and Dissemination of Medieval Manuscripts" (Kevin Kiernan); "Chaucer in 2001" (Mary Wack); "Gatekeepers of Memory: Issues in the Chinese Efforts to Organize Their Textual Legacy" (Michael Fuller); "Gate-Keeping A Garden of Etext Delights: Electronic Texts and the Humanities at the University of Virginia" (David Seaman); "Image Use in Art-Historical Practice" (Michael Ester); "The Economics of Electronic Publishing: Some Preliminary Thoughts" (Colin Day); "Fighting Infotainment: The Nonprofit Sector's Responsibility in an Online World" (Michael Jensen); "Will it Scale Up? Thoughts ABout Intellectual Access in the Electronic Networks" (David Blair); "Copyright" (Peter Givler); "The Role of Subsidiary Rights in Scholarly Communication" (Janet Fisher); "Repertory Licensing in a University Environment" (Isabella Hinds); "Why are There Still Lines at the Teller Windows? Copying With the Information Revolution on Campus" (David Hoekema); and "Redesigning, Not Reinventing, Encyclopaedia Britannica" (Joseph J. Esposito). Ten project reports are followed by a summary of the symposium by Jinnie Davis and a description of a tour of the University of Virginia library by Karen Marshall. (JLB)

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WHEN I had smelled the savour swote,
No wille hadde I fro thens yit go,
But somdel neer it wente I tho,
To take it; but myn hond, for drede,
Ne dorste I to the rose bede.
For thistels sharpe, of many maneres,
Nettles, thornes, and hoked breres;
Ful moche they distourbled me,
For sore I dradde to harmed be.
The God of Love, with bowe bent, The God
That al day set hadde his talent of Love
To pursuen and to apyren me,
Was stonding by a fige-tree,
And whan he sawe how that I
Had chosen so ententifly
The botoun, more unto my pay
Than any other that I say,
He took an arowe ful sharply whet,
And in his bowe whan it was set,
He streight up to his ere drough
The stronge bowe, that was so tough,
And shet at me so wonder smerte,
That through myn eye unto myn herte
The takel smoot, and depe it wente,
And therwithal such cold me hente,
That, under clothes warme and softe,
Sith that day I have chevered ofte.
WHEN I was hurt thus in that stounde,
I fel doun plat unto the grounde,
Myn herte failed and frynted ay,
And long tyme ther aswone I lay.
But whan I com out of aswoning,
And hadde wit, and my feling,
I was al maat, and wende ful wel
Of blood have loren a ful gret del.
But certes, the arowe that in me stood
Of me ne drew no drope of blood,
For why I found my wounde al dreye.
WHEN took I with myn hondis tweye
The arowe, and ful fast out it plight,
And in the pulling sore I sight.
O at the last the shaft of tree
I drough out, with the fethers three,
But yet the hoked heed, ywis,
The whiche Beautee calléd is. Beautee
Glan so depe in myn herte passe,
That I it mighte nought arace;
But in myn herte stille it stood,
Al bledde I not a drope of blood.

Gateways, Gatekeepers, and Roles in the Information Omniverse

Proceedings from the Third Symposium

November 13-15, 1993

Washington DC

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Gateways, Gatekeepers, and Roles in the Information Omniverse

Proceedings of the Third Symposium

Ann Okerson & Dru Mogge, Editors

November 13-15, 1993
The Washington Vista Hotel
Washington, DC

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Foreword

"The gods walk the earth, and mere mortals must stay out of the way or be crushed underfoot."

Joseph J. Esposito, speaking at the Third Symposium

In their relatively short history, the joint Symposia between the Association of American University Presses and the Association of Research Libraries have stretched and delighted registrants. More than just a way to pass a few instructional days with like-minded colleagues, the events are intended to be collaborative and fruitful venues. The organizers and participants have invented a forum for those who seek to advance the efforts of not-for-profit scholarly publishing: the university presses, the society publishers, academic librarians, faculty, and fellow travellers. The series has been fortunate to attract co-organizers and collaborators who have contributed important personnel resources to make the Symposia a success. The American Mathematical Society worked closely on conceptual and technical parts of the first two Symposia. As an adjunct to the Third Symposium, the University of Virginia Library offered "A Day in the Electronic Village," an instantiation of the emerging electronic information environment. The National Science Foundation has helped and hurrah-ed each event.

Progress has been recorded and the series is evolving. The first event (April 1992) presented a sampler of faculty who are self-publishing formal electronic works supported by their universities' networking capabilities, as well as some large scientific societies making substantial investments in the new area of networked publishing. That spring in Washington, DC, most participants admitted to feeling very much like lesser mortals who might well be crushed under foot. The second event (December 1992) expanded the offerings to include many more projects including early innovations by university presses. This third meeting intensified exploration of publishing issues such as economics and copyright and broadened the array of project presentations. While few felt like gods, at least the danger of being crushed felt like a worry of the past. All presentations are represented in this volume.

The planners, encompassing a number of interested volunteers from the AAUP, ARL, and society groups, meet on e-mail and are in the early stages of conceptualizing the late 1994 Fourth Symposium. Building on experience to date, the group hopes to issue a call for presentations to include technical breakout sessions, project sessions and discussions groups, as well as to focus plenary sessions on airing and finding solutions to problems that vex faculty, librarians, and not-for-profit publishers. The expressed objective is that through this series we will all find better ways to work together to fulfill the educational, scholarly, and research missions of higher education through improved scholarly communications.

Special thanks go to:

• Lisa Freeman, Chair, AAUP Electronic Caucus, who did so much to organize the event, and the Caucus itself as an advisory group.

• Karen Marshall, Alderman Library, University of Virginia, for arranging a highly successful Charlottesville event for the 40 symposiasts who made the trek after the conclusion of the November Symposium in Washington, and for the followup wave that the Library hosted in December.

• Annette Verna, Program Assistant, ARL, who has provided indispensable support in producing this collection.

• The authors and presenters for their patience in being badgered for their papers.

• All the registrants for this cost recovery series: about 70 the first time; 110 the second time; and 160 this time, for making the time and finding the resources to participate.

On behalf of the the above individuals and of AAUP and ARL, we hope to see you at the next Symposium.

Ann Okerson
Association of Research Libraries

Opening Remarks for the ARL-AAUP Symposium Scholarly Publishing on the Electronic Networks

Lisa Freeman, Director
University of Minnesota Press

Good afternoon, and welcome to the third Association of Research Libraries/ Association of American University Presses Symposium on Scholarly Publishing on the Electronic Networks. I am delighted to be here to open today's sessions and to introduce the larger theme of this symposium: Gateways, Gatekeepers, and Roles in the Information Omniverse.

A number of people deserve special mention for their support of the symposium. In particular, I would like to thank Duane Webster, Executive Director of the ARL, for his ongoing commitment not only to these joint symposia, but to the larger effort to strengthen and expand cooperation between research libraries and university presses. I would also like to thank Peter Grenquist, Executive Director of the Association of American University Presses, for his role in facilitating a host of new activities in the larger arena of electronic publishing, including support of this symposium but also of the newly announced joint CNI-AAUP Initiative on University Presses in the Networked Electronic Environment. It is very much to the credit of both Duane and Peter that these symposia have been so successful. Their individual commitment to a model of scholarly publishing that joins presses and libraries, as well as their efforts to help strengthen this natural alliance, are truly visionary. I think it is fair to say that over the past two years, we have seen an unprecedented degree of cooperation and collaboration between presses and libraries, and Duane and Peter deserve much of the credit for it.

I would also like to acknowledge the hard work of Karen Marshall and Kendon Stubbs from the University of Virginia Libraries in organizing the Charlottesville portion of the symposium, and last but not least, my co-chair, Ann Okerson.

I am somewhat uncomfortable describing myself as co-chair when my contribution to this process has been so minimal in comparison with Ann's veowoman efforts in coordinating speakers, hotels, travel plans, and all of the other minutiae that go into a successful conference. More important, I would like to take the opportunity to publicly thank Ann her for persistence in helping to persuade the university presses of the need to become involved in these issues. She deserves an enormous amount of credit not only for pulling off several successful symposia, but for fostering and facilitating the entrance of university presses onto the electronic publishing scene. Thanks, Ann.

In crediting Ann for her success with previous symposia, I am also acknowledging the extraordinary progress that has been made by the university presses themselves. At the first symposium, all of two years ago, there were a half dozen rather confused, and I daresay rather defensive, university press directors huddled in the front of the room each day, furiously writing down acronyms that made no sense and wondering what the hell we were going to do when we got home. I know, because I was one of those directors. This year, we have nearly fifty university press registrants.

As further indication of changes that are afoot, I would like to share some very encouraging news from the university press front. The electronic caucus of the Association of American University Presses recently conducted a survey to gauge the extent (or lack thereof) of computer use among its members. Being largely a bunch of humanists, our survey was of course largely

unscientific. But the general results are informative.

Of the 63 presses surveyed (more than half of the AAUP membership), all reported the widespread use of computers. 35 (56%) reported that everyone had a computer on their desk, while another 27 (43%) indicated that at least half of the staff worked regularly on a computer. Fifty-nine presses (94%) indicated that they were using desktop publishing technology in some form. Forty-five presses (71%) have an Internet connection, and twenty-one presses (33%) have at least one "electronic book."

What these numbers do not reveal is the pace of change. I doubt whether many presses had an Internet connection as recently as two years ago, and I suspect based on anecdotal evidence that the number of presses with electronic books in the works exceeds the number who have already published one. University presses are, I think, ready to assume position — and the responsibilities — of full-fledged partners in the emerging electronic world.

As I have argued elsewhere, I believe that publishers generally, and university presses more specifically, have three major contributions to make to the publishing process in the networked environment, and these are the same contributions that presses make in the paper world: gatekeeping (not simply peer review but also the seeking out, developing, and encouraging of scholarly research and writing); readability enhancement (including copyediting, proofreading, and design); and marketing and promotion (that is, telling the right people about the right book). I am increasingly convinced that these three functions will become more, rather than less, important as the network grows.

Similarly, librarians continue to perform a number of crucial tasks in the electronic world, including gathering together work once it has been published, indexing, archiving, and preserving that work — in some cases long after the original producer of that information has ceased to make it available; and generally facilitating access to a rapidly increasing number of information sources.

Recognizing what it is that we each uniquely contribute to the process is, I believe, an essential first step toward refining — and note that I did not say re-defining — our roles in the so-called information omniverse.

Having identified what I believe to be some of the most important aspects of our traditional roles that seem to me to remain crucial in the electronic world, I would like to suggest several areas in which we, as producers and distributors of scholarly knowledge, can and must bring this expertise to bear if the potential of the electronic world is to be fully realized.

There is much to be excited about when contemplating the future of publishers and libraries in the networked world of the future. Equally, there is much about this emerging future that concerns me. As a relative neophyte in matters pertaining to cyberspace, I find myself swinging wildly at times between these two extremes: thrilled by the possibilities of new technologies, and terrified by the potential threats to the democratic order that such capabilities present. There must be a middle ground on which technology can be put to good use without contributing to the ever-widening gap between the information-rich and the information-poor or exacerbating the general trend toward increased surveillance and monitoring of both our public and private lives.

When we speak of roles, then, I think one of the most important that we in the non-profit research and education sector can play is that of leader. The views of those in the so-called knowledge industries are increasingly important as public debate about the National Information Infrastructure heats up. Libraries have been out front on these issues for some time; university presses are just beginning to participate; and scholars are, I fear, still lagging somewhat behind. It is the traditional role of publishers and librarians to foster and contribute to discussion about important social issues. The shape of the information omniverse is one that deserves — indeed demands — our attention, even beyond consideration of our own specific roles in it.

There are, I think, four areas in particular where we can and must exert a stronger influence.

First, leaving aside for the moment the entertainment potential of the networks, much, in fact virtually all, of the discussion that has taken place about publishing in the networked environment has focused on the production and dissemination of *technical information*, whether it be the conversion of STM journals from print to electronic formats or the increasing opportunities for database publishing. Much of this discussion is about facilitating the exchange of data or facts or information among researchers whose highly specialized interests often make them a very small, very cohesive, and easily identifiable group of *both* producers and consumers.

The ways in which the gateway and gatekeeping functions evolve in order to serve these audiences may be very different from how they would develop in service of the humanities and social sciences. The artifact of intellectual work that we know as the book or journal is not the same as a data set, and the technologies, policies, and modes of access developed to consume this unique creature probably ought to be different as well. Scientists and humanists simply do not conduct their research in the same ways.

Although there are an increasing number of groups and initiatives that represent the interests and concerns of those who work in the human and so-called soft social sciences, university presses and research libraries may be among the most visible and therefore potentially the most effective advocates of this often overlooked group's concerns.

Second, all too frequently, discussions about electronic publishing begin with an assumption about access that is simply not accurate if you move outside of the scientific and technical communities. When we talk about making a conversion to publishing in a networked environment, we must again keep in mind who we are publishing *for*. At Minnesota, for example, the humanities faculty still have rotary phones in their offices. If one of our primary roles is to ensure the widest possible distribution of scholarship, doing so electronically may in some cases be in direct contradiction to achieving this goal. Information for whom, we must ask.

Third, good scholarship is heavily dependent upon an assurance of academic freedom, that is, the ability to pursue one's own ideas within certain ethical constraints free of any kind of intellectual restriction. The inevitable commercialization of the networks, the centralization of the service provider function, the information storage and retrieval capabilities of the network -- all of these trends point to an enormous increase in both the likelihood and the extent of surveillance. Gateways and gatekeepers are logical points at which to exert -- or resist -- surveillance. We must be alert from the start to our potential roles as unwitting accomplices via complacency or sheer ignorance. More importantly, we must take a proactive stance in insisting that adequate guarantees of privacy and security are built in to whatever system of electronic communication eventually emerges.

Finally, we should remember that at the most basic level, we are in the business of scholarly communication because we believe in the fundamental importance of research and education. We purport to foster and encourage new ideas, and to provide quality outlets and avenues for the dissemination of those ideas. We are, first and foremost, facilitators in the crucial process of scholarly communication.

Our primary audiences -- researchers, teachers, and students -- the people who we in theory serve, are in many respects the least well informed about the implications of the shift to electronic publishing. It is in our best interests, not to mention the interests of society at large, to assist the creators of scholarly works in making this transition and to encourage their participation in the debate. Without the involvement of our authors and readers, we run the very real risk of devising a system of scholarly communication on the networks that no one wants to use.

What I am suggesting, then, is that leadership may at this juncture be the single most important function that we can perform. Decisions are being made daily about the shape of the future National Information

Intrastructure. We have much to contribute to the discussion, even those of us who may feel that we don't know enough about the technology to participate in any concrete way.

Many of you in the audience today are, I suspect, uncomfortable with the notion that you can constructively participate in, and influence, the shape of things to come. To the contrary, I would argue that scholarly publishers, librarians, and others involved in the dissemination of scholarly research and information are among the most qualified to speak about these matters. Our experience, our professional expertise in matters pertaining to the production of knowledge, is perhaps more important than any of us realizes. And our potential contribution reaches far beyond the world of scholarly research and writing per se. We owe it to ourselves, and to the ideals that underlie our basic understanding of what it means to live in a free democratic society, to involve ourselves in these debates. I hope that you will bear this in mind as we spend the next two days exploring the truly revolutionary potential of the networked world. Thank you.

We're All in This Together, Aren't We?

Bruce Sterling
Science Fiction Writer

Hello ladies and gentlemen, my name is Bruce Sterling and I'm a science fiction writer from Austin, Texas. I've been generously given a whopping half-hour today to discuss the fastest technological transformation in human history.

I've devoted a lot of thought and speculation to this topic lately, and that's why the last ten minutes of my speech today is going to seem completely insane. However, by the time we get to the really zany part, you should be so shellshocked that the truly science fictional element should begin to make a dreadful kind of sense.

Let me roll up my sleeves here, and let's take a breath, and let's begin by talking about how "not" to do electronic networking. We're gonna start slow, and by slow I mean, of course, Prodigy. Prodigy, the network where an electronic response on a topic can take three full days.

I wish I could honestly say that I hate to pick on Prodigy, because it hardly seems sporting to kick a service when they're so openly and publicly down, but these are people who spent over nine hundred million dollars on their dreadful, hateful idea of a network. When one thinks what the world would look like today if nine tenths of a billion had been dropped on gopher, wais, archie, mosaic, and veronica, it makes you want to weep aloud. So indulge me, join me in a sadistic chuckle as I give Prodigy some hell.

Because they deserve it! Their unspoken slogan was "We're IBM and Sears so we must know what we're doing." But they didn't know. And worse yet, they were slow to learn.

Prodigy was a network that wanted a vast population of users whose activity would also be devoid of serious controversy. This is humanly impossible. They also wanted to magisterially push their data through a wire to a population of millions of people equipped with machines that allowed them to speak back. This is an oxymoron.

Prodigy yearned to be the Disneyland of Cyberspace, yet failed to grasp the fact that even sweet old Walt Disney is controversial some times and in some places. In Europe, people openly despise Mickey Mouse as if he were some kind of bipedal plague-rat carrying the deadly virus of American popular culture, and as for dear old Walt himself, he informed on Commies for the FBI and is popularly supposed to be locked in a cryonic icebox somewhere. Prodigy was born with all the drawbacks of Disney — the creepiness, the corporate hermeticism, the over-sanitized atmosphere — and yet none of Walt Disney's original table-top imagination and vision. Everything in Prodigy was supposed to be redolent of glowing family values and shrink-wrapped Norman Rockwell normality, but adults don't like to live and play in a sandbox.

Seen in their entirety, the list of Prodigy scandals (to date) is truly dismal. There was STAGE DAT. That was a piece of Prodigy software installed on the user's computer, that, incidentally, could access tiny little chunks of the user's hard disk and send them back to Prodigy HQ. Prodigy got accused of using the STAGE DAT software as an Orwellian monitoring device deliberately spying on the private contents of user's computers. Other publishers, other services, could have easily shrugged off this nonsense, but this terrible piece of utter urban-folklore was actually "believed" about Prodigy.

Then there were the flaming problems. Every network in existence has people who flame, but

on Prodigy, flaming was considered a clear and present danger to peace and good order, so that when devout Mormons started crossing verbal swords with gay-lib activists, Prodigy napalmed the debating ground by eliminating the entire topic. This is creating a desert and calling it peace.

And there was, of course, the censorship. Not rigid censorship, not entirely unreasonable, but scary and irritating through its lack of consistency and its clear failing to sympathize with the social values of users. On Prodigy you couldn't use the word 'bitch'. Nor was it subject to debate; since Prodigy considered itself a 'publisher' and its users as grateful peons, you couldn't even publicly bitch about using the word bitch. You couldn't post in German or French because you might be saying rude things the censors didn't understand.

Then there were the technical problems, not in the network itself, which worked okay though slowly, but in the growing primal struggle for control of the network itself between the company and the users. When Prodigy users found themselves forbidden to discuss certain topics publicly, some among them built software devices that created private email distribution lists. There was nothing new about email distribution lists. Email distribution lists were the lifeblood of Bitnet and Arpanet and they were common knowledge in networking circles, but on Prodigy this vital networking practice seriously interfered with the generation of revenue. So first Prodigy tried to ban distribution lists, but they did not have that power; the users had written the distribution software themselves, so Prodigy was trying to ban the contents of people's personal computers. But email was flooding the system, so Prodigy began charging for email, a direct violation of their original users' contract. For that action Prodigy got sued by state consumer protection agencies, and defeated, too!

There have been waves of mass defections from Prodigy as Prodigy convulsively changed their basic rate structure to accommodate the user-forced mutations of the system. People used the Prodigy system itself to urge one another to leave. Then there were the mass firings of staff. In the meantime the Internet, which has no promotional budget at all and an interface only a UNIX freak could love, has been growing at twelve percent a month. There's a good book in the destiny of the Prodigy network, but I feel it would take a very mordant soul to write it. What journalist would want to write such a thing, when the stuff going on outside the Chinese walls of Prodigy is so much more entertaining and fun?

Jack Rickard recently wrote a fine editorial in his bracingly iconoclastic magazine BOARDWATCH. Rickard argues that there is a fatal flaw in the very idea that you can segregate users inside a closed electronic network and force them to generate money for you through their existence as a captive audience. Email, Rickard says, wants to be free. You can't lock people inside your electronic company town, as Prodigy wanted to do, and therefore assure that they are physically incapable of ever looking elsewhere. What you must do is entice the free populace off the virtual streets and into your store through offering superior goods and services. We're all in this together. You cannot separate us one from another, and enslave us as captive consumers jailed inside a single system. That's been tried. It's the philosophy of the proprietary system, the closed shop, the Berlin Wall of software. It doesn't work. Today even Prodigy gets Internet email, but what will happen when its users learn of ftp and telnet and gopher?

A computer network is not a gumball machine where the owners put in a big bag of bytes once a month and the customers drop in nickels and hope they get a nice red one. To retail information in this mechanical fashion ignores the nature of the network phenomenon. A network is a living thing. A network is like a language.

To give people modems and PCs is to give them the power to speak as well as listen. And yet Prodigy was painfully determined to make every pixel in cyberspace into a potential sales opportunity. It's as if the English language were owned by totalitarian English teachers who charged you a royalty every time you conjugated a verb. Their control over the language of Prodigy was fatally pedantic, allowing no mutations, no modifications, no spontaneity. If Prodigy owned the English

language, a taco would be officially known as a "cornmeal crispette."

That's why Prodigy could not come to life. Its language was as stiff and pure and dead as ecclesiastical Latin. Prodigy was like a cocktail party where a bunch of brownshoe IBM and Sears guys were standing in the corners with their arms crossed with signs over their necks that read "I'll say something really witty if you give me a dollar." And even if they do have something worthwhile to say, well, that's not a party.

You can make pretty good money out of being a witty guy in public. You can go to parties and be witty for no pay, just to enjoy yourself and give others pleasure and to feel like a human being. Or you can become a professional stand-up comedian. You can pick up the mike and talk, kind of like I'm talking now, and everybody will sit still and listen and laugh sometimes, and I walk off with a bunch of your money. But suppose I give everybody in this audience a microphone. How long do you think I'll get away with standing here talking and the rest of you sitting there in rows silently with adoring looks on your faces? Not very goddamned long, brother.

Not unless I send a bunch of censors out to enforce my idea of order and throw the more demonstrative audience members out the door. I can claim that I own this room, and I'm paying for these microphones, and I'm far more interesting than any other topic or any other person in the world, so shut up. But that won't stop you from talking, so I'm gonna have to shut some of you up, the hard way. And once that starts happening, I don't think you've gonna find my comedy routine very amusing any more. My comedy routine is gonna be about as bright and "entertaining" as compulsory company calisthenics.

Well, the Prodigy party ain't over yet, they're hiring new policy guys and they're looking for new advice, they're not looking among cybernetic librarians though, so hopefully they'll never hear my uncharitable comments. Anyway, I don't think the lesson is learned quite yet. Even if Prodigy expires on the barbed-wire in the no-man's-land of the electronic frontier, coming right behind them with even more money and probably even less brains, are the Disney Bells. Heard about Disney Bells? That's the Silicon Valley street slang for the regional Bell telephone operating companies that are busy buying and merging with cable TV companies so that they can get into the information superhighway entertainment business. It's getting a lot of press lately, even more press than the original launch of Prodigy, but I have my doubts. I mean, when was the last time a phone company did something you found really entertaining? Compared to cable TV and the phone company — universally feared and despised monopoly enterprises — even IBM and Sears seem kind of lovable and cuddly. Disney Bells indeed, why, I bet good money Walt Disney's spinning in his block of ice.

So if that's not the way to do networks, what is the way to do them? Well, my suspicion, growing year by year kind of like the Internet has been growing, is to treat networks like language. Give everybody the power to speak and listen. Distributed nodes, like the Internet, like Fidonet. Networks that grow organically like language-use, not ruled top-down by an army of occupation.

And let's keep the basic means of communication out in the open, shall we? Our language should have a legible alphabet of openly written and openly debated and openly testable interfaces and standards. We don't want a secret, proprietary alphabet as arcane as Egyptian hieroglyphics, not unless we prefer society with a priest class, a scribe class and a Pharaoh.

Sure, you may ask, but where's the money in a network like that? Well, I riposte, where's the money in English? Of course there's a lot of money in English. You can teach English, use it, codify it, assemble it and deliver it in public, even copyright certain assemblages of it and trademark the occasional little coinage. There's not a lot of direct money in trying to license grammar or manufacture new adverbs, but, by golly, English is a very useful and flexible and omnipresent system, and it has a hell of a lot of contented users.

You can, of course, try to restrict English and corral people with your own proprietary

versions of English. This happens all the time but the descriptions of this practice aren't very flattering. When people treat English the way Prodigy treated networking, it's known as jargon. Bureaucratic gobbledygook. The hard sell. Adspeak. Slang. Criminal argot. People feel instinctively that when it comes to the English language we are all in this together. We don't feel corralled inside English. It's not enforced on us — or at least, not too ferociously enforced. We're just inside it.

Suppose networks really were like language and were recognized to be that way and treated that way. Who would run networks then? Retailers? Publishers? Well, no — that doesn't sound very plausible. How about lexicographers? Not too bad! Librarians? Excellent choice! Semanticists. Free speech advocates. Schools and academies and universities. Not private enterprise, because private enterprise doesn't own languages any more than it owns oxygen or the color red. The government subsidizes language — it teaches English, it teaches literacy, with our tax dollars. This is universally recognized as a public good — anyone who said that American children should be kept illiterate because it costs too much to teach them to read would be considered a complete Neanderthal. If we let the government subsidize language, what's so odd about letting the government subsidize networks? Not run them from some over-centralized bureau — just subsidize them locally, as a public good. We can all agree that it's a good idea that our citizens be literate, so why shouldn't they also be network literate?

Of course this means surrendering some control over the network. But if we think of the network as language, it suddenly seems wisest to let it go. People think networks will be put to evil uses if they are not closely monitored and tapped. This is true. But language is also put to evil uses, and we don't record all conversations or try to shape English so that conspiracy or evil expressions are impossible. It seems outrageous to police language, to put ourselves at the mercy of political lexicon police — social engineers whipping society into the shape they desire by enforcing an Orwellian NewSpeak. People do try that — they'll always try it, because censorship is a more powerful urge than sex. But it doesn't work.

I'm beginning to believe that this process of letting go of control over networks is not only possible but plausible, and maybe even actively desirable. It's what has already happened in the world of computation, after all. The empire of the mainframes is like a herd of slow-moving elephants eaten alive by an endless tide of desktop army ants. People used to sell computer time; now there's so much spare computer time that people sell screensavers. Screensavers are prettier and more clever and creative than a bill for computation cycles.

Computation doesn't belong by its nature behind glass walls tended by the labcoat priesthood; it's become gaseous. What was once a heathen idol on a pedestal is now like the tongues of fire from the Holy Ghost. There are computers in doorknobs now, on people's wrists, wrapped around their eyes and ears, responding to the human voice.

I'm speaking in visionary terms now, but it requires visionary terms to imagine what's really likely from computing. This is an industry where an individual with a single PC from 1993 has more computing power than NASA used to land men on the moon in 1969. Computational speed and power expands by orders of magnitude. Storage, too. If there's room for NASA's entire 1969 electronic brain in your 1993 desk, then your desk has the power to devour almost anything that can be made into ones and zeroes.

Desktop libraries, for instance. Huge libraries for the individual. Not farfetched at all. There's a case in the courts now of a software salesman in Oklahoma City arrested by city police for computer pornography. He was selling publicly available CD-ROM disks with risque images on them — ten thousand or so images per disk. It's been calculated that if the Oklahoma pornography statutes were strictly enforced against this man, he could spend one million years in prison. One million years for a flat plate the size of your hand that is meant to be hooked to a bulletin board system. How on earth can we control this? It's hopeless, like trying to control every conversation in America to make sure no one ever says a dirty word. Can

one stop CD-ROMs, these tiny items, from travelling wherever they please? After all, if you want to smuggle them over our national border, all you have to do is hide one inside a ton of cocaine.

This means that one's desk can gobble up fantastic amounts of information using methods impossible to police.

An institution such as AT&T or IBM or the National Security Agency looks desperately out of place in such a world, like a whale being ripped to shreds by hordes of invisible piranha. What kind of organized institutions could survive in such a world?

Well, if industrial-age giants totter, perhaps pre-industrial ones might prosper. The academy for instance; the Academy is a very old institution, and once it was just Plato's users group under some olive trees. The University is a very old institution, currently it's under ruthless and protracted siege from powerful commercial forces, but if the very nature of commercial forces change, then universities suddenly look considerably more vital and attractive. Academic life has a set of values: knowledge, meaning, civilization, philosophy -- that start to look very appealing in this deluge of information, this world of machines gone ultra-connected and gaseous. In an information deluge, meaning is an ultimate luxury and context a profound value.

And the ancient institution of the Library. Libraries like Alexandria were powerful but vulnerable. However, with infinite replicability, anonymous access and practically unlimited storage, libraries suddenly look very hard to kill. They're not the same libraries where bookpullers follow you nervously to make sure you don't damage the limited editions, but they do seem to have a solid potential role as noncommercial sites offering access to vast amounts of information. Libraries might not sell information per se, but in a world of instant global access and swift replication, libraries become great shadowy beasts in cyberspace, powerful allies and providers of highly useful services. After all, libraries too offer context; anybody may be able to get all the ones and zeros they want, but librarians know how to put things where they make sense.

Getting data costs nothing; storing data costs nothing; but making sense of that titanic heap of data -- my God, that suddenly means everything! Who cares who published it? Who cares who wrote it, even? But the person who can tell you where to find what you need to know -- or the person who can successfully guide your attention to the thing you didn't know you needed to know, that needle of proper information in a Matterhorn of digital haystacks -- this person is suddenly inheritor of all the social power that the other people in the data stream have lost. There might be real power in this, maybe even more power than librarians have every had before. A shift in social power and authority, from publisher and author, to critic and archivist.

Before you get all exultant at the prospect, don't forget that power corrupts. One could even imagine evil libraries, criminal libraries stuffed with dangerous knowledge, offshore data-haven libraries where forbidden information is kept. Or entirely anonymous libraries of encrypted information of a Borgesian complexity, where the only way to kill the cloud of data is to change formats. Libraries in a million shapes, libraries split and skewered over entire continents. Great radiating species of libraries ecologically adapting to every niche in cyberspace. Libraries too small to see with the naked eye, bounded in a nutshell but full of infinite shelf-space. Libraries encoded on the thumbnail, libraries written into the genome, libraries disguised as noise and distributed hidden inside apparently innocuous digital tapes. Libraries as immaterial and ubiquitous as frost on the windowpane and cracks in the sidewalks. Libraries in satellites that rise like the morning star.

Yesterday I heard tell of a new concordance in ancient Greek, a CD-ROM disk with every known ancient Greek text on it. We would be fools to trust the archival permanence of that CD-ROM disk, because CD-ROM is a primitive technology, the functional equivalent of an Edison wax cylinder, with a lifetime maybe one thousandth that of a dead sea scroll in a jar in Galilee. But we can put every remaining word from ancient Greece, that great human civilization, into a device you can hold in your hand. If only Alexandria had done that -- cut

copies of itself on diamond-hard sheets of CD-ROM and hidden itself in salt mines and in jars and in buried chests. The librarians of Alexandria couldn't do that. Perhaps, given the nature of their society, they wouldn't have wanted to. In the end, their scrolls were fed to goats and burned to heat the water in the public baths.

We're mortal, too. Our civilization is also fragile. But with so little thought and effort, we could see to it that the human race never lost another word of the Greeks. What a fine thing that would be to do. What a credit to our civilization. It really seems to me that a civilization that could do that favor for humanity, for the unknown and unknowable generations to come, would truly deserve the name of greatness.

But on the other hand — is that practical? Do we possess the vision to do such a thing? It wouldn't pay much, would it? Not like 500 channels of market-proven reruns and a whole bunch of home shopping networks. We could settle for that — if we were stupid enough. "Never mind that visionary stuff — step aside, I'm a retailer and I've got a business plan!"

To which the digital activist replies: "Step aside, eh? Well, I'll go, Mr. Business Plan — but I won't go where you expect! And by the time you get to the places worth going, you'll find me already there and grinning!" That's all I've got to say today, thanks a lot for listening.

The Library As Mind

D. Kaye Gapen, Director
University Library Case Western Reserve University

Introduction

> "I am convinced that the role of the librarian in society ... is to maximize the utilization of graphic records for the benefit of society. In other words, his function is to serve as the mediator between man and graphic records, not only books, but sound recordings, pictures, audio tapes, charts, whatever contributes to the advance of human knowledge ... The object of the library is to bring together human beings and recorded knowledge in as fruitful a relationship as it is humanly possible to be."[1]

When Jesse Shera wrote this in the 1970's, he was only capturing a timeless professional hope and expectation. At the time he could see the possibility of fulfilling the expectation differently, but only today do we have tools powerful enough to really begin to "bring together human beings and recorded knowledge in as fruitful a relation as it is humanly possible to be."

It is a pleasure to be here with you today. I would like to share with you recent experiences at Case Western Reserve University where five years ago the President and the Board of Trustees made a conscious decision to create a University which would be characterized as an Electronic Learning Environment. At the same time, President Agnar Pytte focused anew on the University's libraries, with a commitment to raise funds for a new library building, as well as the appointment of a campus-wide committee charged with understanding and describing the Library of the Future (LOF). The LOF Committee finished its work in 1990/91.

When I came to CWRU in 1991, I had special responsibilities to build upon the general directions outlined in the LOF Report in understanding the specifics of the library which had to appear in the physical plant for the new library building. Second, I had to build the roadmap which would lead to the creation of the LOF.

What I will share with you today are some of the highlights of the road map, particularly the models and analytic tools which we believe are fundamentally useful in constructing the library of and for the future.

Campus Context: the Electronic Learning Environment

> "We want this Environment to support the ability to visualize relationships in new ways, to compare and contrast, to rearrange and restructure, to analyze and integrate, and to negotiate issues crucial to the conduct of social life. We want not only to construct a campus through which people move easily, but also an environment in which people communicate differently."[2]

The above description of President Pytte's vision for the university is a one that requires substantial support from fiscal resources, personnel, services, systems, and campus infrastructure. It is also a vision that requires one to think differently about the library's mission, its services, and its users.

Infrastructure

One cannot underestimate the importance of infrastructure in the Electronic Learning Environment (ELE). The infrastructure is more than just a physical or structural underpinning for a campus-wide system. The parameters of the ELE infrastructure dictate a great deal more than the traditional physical installation, maintenance, and convenience factors inherent in traditional infrastructures. In an

environment where the product supported by the infrastructure is digitized data and in an environment where all forms of recorded knowledge can now be digitized, the viability of the infrastructure literally dictates what kinds of data can and cannot be carried and utilized by the system and users served by that infrastructure. Data formats that cannot be accommodated by the infrastructure cannot ever reach the end-users, now or in the future, and can never be part of the user environment and can never play a role in future approaches to fulfilling the university's mission. While the infrastructure remains largely invisible to the end-users, it is an expensive and critical component in an ELE and it's role is absolutely vital since it quite literally dictates the extent to which all other components may play a role. If an infrastructure is incapable of carrying photorealistic graphics or full motion video or digitized sound, those components can never be a part of the campus environment.

At Case Western Reserve University, we are fortunate to enjoy a point-to-point, fiber-optic network, where each computer, each laser printer, each network-compatible node in each end-user configuration has the option to share in a rich and growing set of networked resources. This infrastructure is the result of hard working and intensive long-range planning efforts. It also requires the constant and vigilant care of a group of highly trained and skilled network engineers. In terms of working with massive amount of point-to-point fiber optic cabling, these staff members represent some of the most experienced personnel in the country.

The cost of the infrastructure to properly support an electronic learning environment where the university community can think, learn, communicate, and research in a new way, is high in terms of fiscal and personnel resource, but without a comprehensive and soundly maintained infrastructure the long terms goals of an electronic learning environment cannot be realized.

Utilizing the Infrastructure

Once the required infrastructure is in place, other support and utilization mechanisms must be re-envisioned in light of their role in the Electronic Learning Environment.

Assumptions

In fulfilling my role of envisioning the Library of the Future, I have formed some basic tenets as a result of my thinking and research and experiences. For the first time in history, every form of recorded knowledge can be digitized. This is an absolutely critical fact since it makes possible things that have never before been possible. In practice, hardware and software developments dictate that some formats are currently more heavily used and processing speeds make text-dominated environments friendlier to low-level computer configurations, but that is not the long term picture. It is not important right now that commonly available static storage mediums (optical and hard disk drives) are not equipped to store digital sound or full motion video in any quantity. It is not important that voice recognition is still widely limited to basic commands or that voice synthesis sucks up large chunks of RAM needed elsewhere. Those are problems of the moment, subject to the next wave of hardware and software development, and not the stuff of which future planning for a library or any other institution are made.

It is useless to form certain questions in a deductive mode, such as "How will we use this new technology (whichever technology is in question) to do what we do now? How will it affect our current practices? How will it help us do something better?" Forming questions in this manner isn't productive when too little is understood about all the ramifications of a new technology. It is more productive, though significantly more challenging, to ask "What can we do with this technology that we have never done before?" This often involves discovering a remarkable new solution and then going off in search of problems that this new solution can address.[3] This is not what most of us are accustomed to, but it is actually quite practical since no one can accurately estimate the impact of a technology that lies outside their current experience. Traditional deductive thinking may actually prove quite costly in that it may result in completely missing a new possibility because there was no clue of its existence in existing patterns.

The most powerful thing associated with information technologies and the accompanying computers, peripherals, and infrastructure, is their ability to empower the individual, to accommodate the individual need in an effective and affordable way. Such a possibility means that service providers may acknowledge markets and client needs that were previously impossible or impractical. This also means identifying and adjusting to user needs in a way we have not previously been challenged to do so. For libraries and librarians, this will mean knowing things about their clientele that were never before relevant since we had no way to address needs at such an individual level. It may also mean providing services and applying skills for organizing and accessing information at a point earlier than ever before. It will clearly necessitate intensive collaborative work with providers of technological resources (network engineers, digitizing personnel, interface designers, etc.) and re-tooling of librarian's skills at an unprecedented level. Finally, it also means that the mission of the library must change to reflect this new capability of informational technologies to accommodate new users at new levels. The Library of the Future will need to address itself to "knowledge management" as it relates to its users.

New access and control mechanisms will need to be developed to match new data formats and new, textual and non-textual environments. This also means that what defines intellectual property and the forms that intellectual property may take, how it is made accessible, etc. will also evolve in new ways. Strategies for developing these new access and control mechanisms will have to evolve as the technologies evolve and their directions and impacts become more clear. New control mechanisms are also being sought. CWRU is working with IBM to develop Royalty Manager software that helps to track intellectual property rights of materials. It is a component such as this which makes possible the rational establishment of the Virtual Libraries described below.

Specific Tools for Change

Armed with the certainty that the very nature of libraries and librarians will change, our organization proceeded with a number of steps to meet these challenges. While radical change in infrastructure, skills, work relationship, etc. may be the rule of the day, the essential goal of librarianship remains that stated by Shera, to bring people and information together in the most productive way possible. Our definition of Knowledge Management[4] (KM) is that KM is a phrase that describes an environment where an individual can be brought into contact with information in a way that is exponentially more productive and engaging than any currently available environment, an environment where clarity and understanding can be brought to data.

Libraries and librarians, or anyone associated with the task of creating such an environment must concern themselves with forming the right questions, creating the right tools, and recognizing powerful solutions – all of which will combine to produce the first iterations of an environment in which Knowledge Management is possible.

Taylor Model

One of the specific tools employed by the staff of University Library was the Taylor Model.[5] Taylor's model is a theoretical model and is not predictive. The University Library adapted it as a working tool and, in turn, adopted the concepts of "value-adding" and the importance of Information Use Environments as critical guiding principles in the construction of the Library of the Future.

In Taylor's model, individuals work in information environments and part of those information environments are the problem-solving or wrestling with problems or questions that naturally occur. Taylor's model allows that these "problem dimensions" have certain characteristics that exist along a continuum. The model also allows that information also has traits that exist along a continuum. The combination of the user's problem dimensions and the traits of the information involved create a picture of the "information worlds" within which groups of users work. However effectively a given information system (in the largest sense of the word "system") meshes

with the individual or group's Information Use Environment is the measure of the degree of success of that system.

It is inherent to Taylor's model that the degree of "value-added" by any component or service within the system is judged wholly from the user's point-of-view. If it isn't valuable to the user within the user's information environment, than the service isn't valuable, period.

In order to begin to create these pictures of how our campus clientele gather and use information, the staff conducted some 1400 interviews with representative percentages of faculty, staff, and students. The interviewees were asked opened ended question not about how they used existing libraries services, but about how they gathered and used information.

The results of the analysis of the interviews showed that campus users do indeed have very different information gathering and use patterns and that these patterns (described in Taylor's terminology) do differ along the lines of both discipline and scholarly level, i.e., the types of information required by those studying in the humanities are markedly different than those required by engineers. In turn, while the nature of the material is consistent, there are differences even within a discipline among the levels in a user group, i.e., what a humanities faculty member needs is significantly different than what a freshmen in the same area needs. There are even noticeable differences between subject areas in the same discipline such as the visual arts as compared to the literary arts. The differences are not just present in the types of information required, but also in how the information is gathered and used. This means that what each group values and requires differs widely. Often what the library considered important was not what the user considered important. Findings related to major user groups, especially faculty user groups, were taken back to those groups for discussion and confirmation.

The conclusion was that developing profiles of the information gathering and use patterns by precise user group would be a powerful tool for prioritizing and planning. We also concluded that "cookie cutter" services that offered essentially the same services to all users were no longer useful or advisable. These assumptions are in the process of being applied to other areas of library responsibility such as resource allocation, including collection management budgets, personnel deployment, training programs, etc. The need to bring library resources to bear on individualizing library services has become a priority. In keeping with some of the findings of the LSBC, a means to transfer the librarians investment of their resources in activities associated with problem-solving, time-savings, and cost savings activities is also a priority.

These and other findings form that basis for another of our specific projects, the development of a suite of virtual libraries that are discipline-specific. The term "virtual library" refers to an *environment*, an environment in which the "client services" aspect is the most commonly referred to and the most immediately relevant to the user. In our discussion, a virtual library environment is not access to some local or remote OPAC, nor is it access to the Internet or some specific listserver on the Internet. The client server component of a virtual library environment may offer all of the latter as part of client services, but as a concept, a virtual library environment goes far beyond those notions. A virtual library environment is one in which component parts combine to provide intellectual and real access to information, the value of which is framed entirely from the users' point of view, meeting the individuals' unique information needs.

Virtual libraries are not a single entity, but a host of component parts brought together in a dynamic environment. Frequently, virtual libraries are also defined as the act of remote access to the contents and services of libraries and other information resources, combining an onsite collection of current and heavily used materials in print, microformats, and electronic form, with an electronic network which provides access to, and delivery from, external library and commercial information and knowledge sources worldwide. In essence, the faculty member and student are provided the "effect" of a library which is a synergy created by bringing together technologically the resources of many libraries, information services, and knowledge stores.[6] In addition,

librarians will be working collaboratively with their faculty to develop the tools to build, maintain, manipulate, and distribute these collections of data resources.

The Library As Mind

The Library of the Future is many things, some of them very familiar, and some newly arrived on the wings of brand new informational technologies. Among the hallmarks of the Library of the Future will be a new level of intellectual access, new access and control mechanisms to facilitate this new level of access to new formats of materials, new tools to help visualize and clarify data in ways that facilitate understanding, new levels of collaborative involvement for librarian staff, new, more personalized and relevant virtual library environments, and new, more powerful voices for individual users.

No new path is void of peril. All future planning engenders serious risk, but it is imperative that we embrace this risk, just as we must embrace the possibility of error. It is nearly guaranteed that in planning and trying to position ourselves for the Library of the Future, we will surely make mistakes, just as we will surely overlook some important ramifications. We must just as certainly pledge ourselves to correcting ourselves rapidly and continue undaunted to follow our vision. Flexibility and innovations are also hallmarks of the Library of the Future.

Along with the other challenges, most of the long established infrastructures that support us will also have to evolve. Infrastructure like technical support, budgets and economic strategies, evaluation tools, physical plants, policy development, organizational and staffing patterns, etc. will all have to respond flexibly to patterns of change. There will be a high price for all this innovation and change, but the price of ignoring a compelling vision of the future or failing to follow one will be even higher.

In its fullest realization, the Library of the Future will truly empower the individual and truly serve the client. It will be a Library of the Mind and surely that is worth every challenge and risk posed to us.

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[1] Jesse H. Shera, *Sociological Foundations of Librarianship*. 1st ed. (New York: Asia Publishing House), 1970.

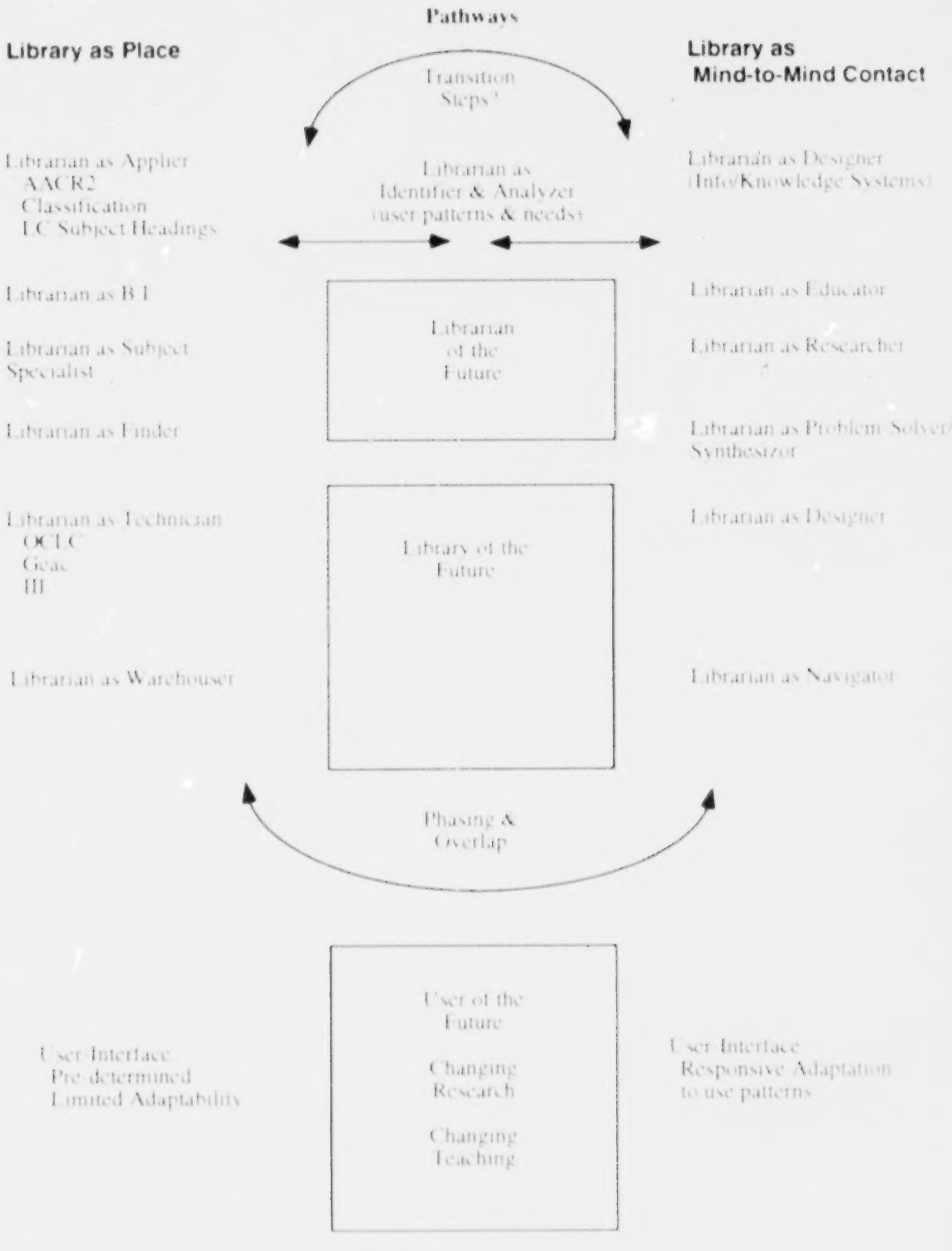
[2] Case Western Reserve University, *Plan for Case Western Reserve University* (Cleveland, OH: Case Western Reserve University), 1990.

[3] Michael Hammer and James Champy, *Reengineering the Corporation: A Manifesto for a Business Revolution*. (New York: Harper Collins), 1993. This book offers an excellent discussion of the importance of inductive reasoning as applied to informational technologies.

[4] D. Kaye Gapen, Sharon Schmitt and Lei Zeng, "Developing Intellectual Access and Control Mechanisms for Discipline-based Virtual Libraries that Feature Media-Integration," *Proceedings of the 4th ASIS SIG/CR Classification Research Workshop*: 179-203.

[5] Robert S. Taylor, *Value-added Processes in Information Systems* (Norwood: Ablex Publishing Corporation), 1986. Taylor refers to his model as "rather an early presentation of a way of thinking about the field of information science" and also as "a frame of reference for ordering what we know about information use environments..." It is a very complex, powerful and sophisticated model. To mention some of its principle components only briefly, as we do in this paper, is to do the model and the book an injustice. Interested readers should examine the book for a true idea of the range of Taylor's thinking.

[6] D. Kaye Gapen, *et al.*, *loc. cit.*



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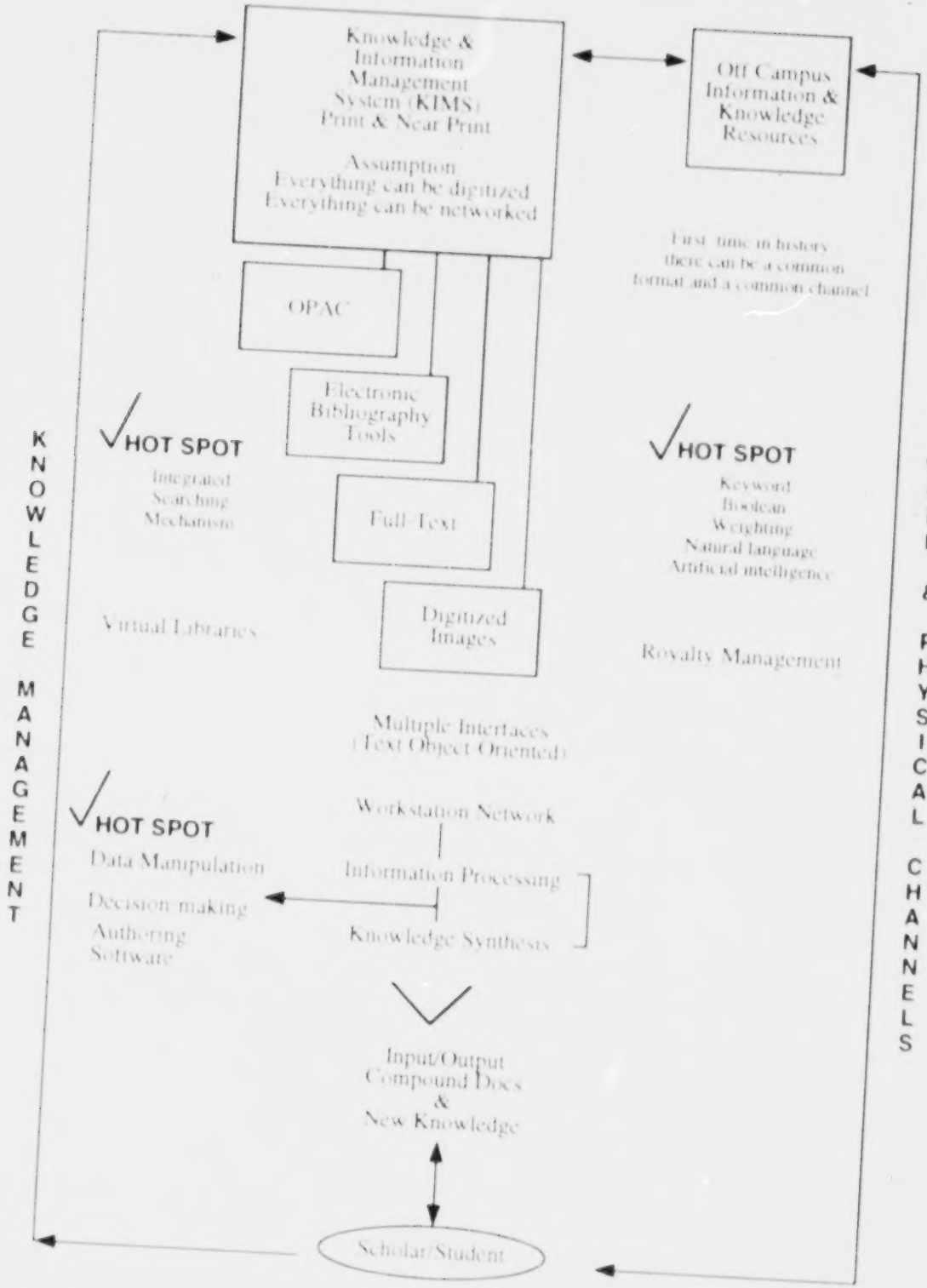

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The Virtual Library: An Idea Whose Time Has Passed[o]

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The idea of the "virtual library" is as catchy as a slogan and as fresh as last week's newspaper.

> "California has stopped construction plans for new university libraries. Instead the state intends to focus its attention and budget on 'virtual libraries.' I gather that this means that all information will be available primarily via computer and CD ROM."[1]

The "virtual library" is a dream that many share, something many have imagined but none has seen. The main features of this vision are a vast, ideally universal collection of information and instantaneous access to that information wherever it physically resides.

A search for the phrase in the computerized databases that offer a hint of the imminent future of fast resources on line reveals that it is indeed a recent coinage, recent, at least, in anything like the current sense. People have long spoken of something that is "virtually a library" as a "virtual library,"[2] but it is only about a decade ago that computer journalists first bandied the idea around. "Consider, too, virtual libraries where you enter into a rich virtual stack space and 'browse' about."[3] For that visionary, the idea clearly involves special goggles and gloves, a feature that seems to have faded from most recent discussions of the virtual library. The phrase bursts through into the popular press only as recently as 1987,[4] where the helmets are still in place to "give the student the ability to go inside a chip visually. We can give him a tour through a virtual library or a virtual museum."

So the phrase suggests a vast collection instantly accessed. But phrased in those terms, the idea is easily older. Few recent discussions fail to mention the article that appeared in the *Atlantic Monthly* in 1945 by Vannevar Bush, imagining a device he called the "Memex,"[5] but they could as easily find an article in the New York *Times* of September 10, 1950, visualized the "Doken," a high speed reading machine which could search the entire Library of Congress in ten seconds.[6]

Although the fantasy has been around now for two generations, surely it is still a modern one, looking beyond the book itself to a visionary's future. Here is the point to confess that I once believed in the novelty of the vision and that this paper began as something quite different: not a eulogy for the virtual library's past but a hymn of praise for its revolutionary future. I even had the perfect visual resource to use as a foil, the monument to the old library. Twenty years ago, at a college festival of the films of Alain Resnais, I had seen a short documentary he made in 1956 called "Toute la memoire du monde," a short subject on the ways and working of the Bibliothèque Nationale in Paris. A period piece, I remembered, singing the praises of a grand institution just as it entered unwittingly the autumn of its career. To find the film now took some trouble, for it was apparently never released in this country, when I did,[7] it took me, thick headedly, some time to realize that what I had was quite different from what I had remembered. To be sure, it was a film that praised every aspect of the BN, but the terms in which it did so were, on third viewing, suddenly revelatory.

Those who know Resnais's early work would recognize the dark and lugubrious tone of the

film but would be amused by its almost comical depiction of life in the library. Everything is mechanized. The row of postmen bringing sacks of books marches to circus-like music, and then a huge apparatus of indexers, cataloguers, fiche-makers, spine-stampers, shelvers begin to mark the process of the book through a librarian's assembly line, until with swift precision the book reaches waiting hands in the great reading room. To anyone who knows the BN, of course, just that swift, unfailing service is what marks this film out as a fantasy, not truly a documentary. But it is the substance of the vision that finally hits home. The huge collection, containing "all" the world's memory,[8] was in its time already the virtual library thought to lie just ahead.[9]

To see the dream in a different technological setting from our own is not merely to recognize that it existed then, but that the existing and foreseeable technology looked like a fully satisfactory way of achieving it. The dream today is weighed down with silicon chips, keyboards, screens, headsets, and other cumbersome equipment — but someday a dream of — say telepathic access will make today's imaginings suddenly as outmoded as a daisy-wheel printer.

What persists, has persisted, and I think will persist is the combination of ambition and self-deception in the ideas that people have in common about their *present* state of affairs. What was excellent in the BN of 1956 was that it was the thing that we now think we must wait another decade or three to recapture. What has changed is not the dream, but the sense of technical possibilities.

But the dream is itself much older than 1956, and its history can help make clear why it still has power. The notion of a library itself is an extraordinary one, of course, and thus fragile. It is surely not self-evident that the words of other times and places, frozen forever in unchanging form, *should* live on indefinitely, in ever-accumulating, geometrically-expanding heaps;[10] far less self-evident that human beings preoccupied with the real problems of their present should spend any appreciable amount of time in decoding and interpreting the frozen words of people long dead. That it *seems* self-evident to do so says something important about the culture that was created using writing and print, but also says indirectly that this culture is contingent, malleable, and far from being the final form of human organization of knowledge.

If the essential feature of the idea of the virtual library is the combination of total inclusiveness and near-instantaneous access, then the fantasy is almost coterminous with the history of the book itself. The earliest example known to me is a famous document of the second century BC, the "Letter of Aristeas to Xenocrates" introducing and justifying the existence of the first major Greek translation of the Hebrew scriptures, the so-called Septuagint.[11] In it, the author attributes to Demetrius of Phaleron, the "minister of culture" for the Hellenistic Egyptian king Ptolemy a century or so earlier who founded the "library" at Alexandria, the ambition of gathering together, if possible, all the books in the world, in one collection.[12] Even the familiar legend of the pigeonholes into which the papyrus scrolls at Alexandria were to fit plays its part in the "virtual library" legend, for it was precisely this economical and easily-managed form of packaging that would speed the access readers wanted.

The library at Alexandria has long loomed as a chimera of power and mystery on the horizon of our culture, but the real makings of our tradition are less ancient than that and clearly betray the presence of the fantasy of the virtual library.[13] And that tradition, Latin in its origins, European in its development, and now "western" in its self-presentation to the whole world, is less old than Alexandria. For the ancient traditions of book-making and book-keeping suffered important interruptions. There are many reasons for what happened in the Latin tradition, some of which have to do with the cultural transformation traditionally discussed as the "fall of the Roman Empire,"[14] but the phenomena were complex. One decisive event was the introduction of the codex for formal literary use, something that happened between the second and fifth centuries.[15] This meant that none of the books prepared and used in the old way, on papyrus rolls, would survive under uninterrupted care in the Latin west.

Texts on those rolls that survived did so by being prudent enough to be copied over into the codex form (usually on animal skins rather than papyrus).[16]

The discontinuity between ancient and late antique library communities overlaps and closely (but not exclusively) resembles a discontinuity between the traditional literary culture of antiquity and the chiefly monastic Christian textual culture of the middle ages. Further, the discontinuity that emerged between Greek and Latin is important. Classical Latin literature always lived under the shadow of Greek literature, but in late antiquity the Greek shadow passed and Latin began to live on its own.[17] Christian Latin literature in particular had a general sense of obligation to its own Greek past, but little or no linguistic aptitude for confronting or cherishing that past. It is from roughly the fifth century A.D. that the western Mediterranean and its dependencies to the north and west become wholly, independently Latin, save where the Romance and Germanic vernaculars begin to come into use, though their literary pretensions would be relatively slow developing.[18]

In that fifth century a self-conscious tradition emerged. It took written texts seriously and began to organize them into a theoretical constellation that took flesh from place to place as real collections of books. There are a hundred signs of this.[19]

Compare for example two influential books of that period giving advice to the Christian scholar. Augustine wrote "On Christian Doctrine" around the year 397 and in it set out the principles for the interpretation of scripture. Itself a sign of the text-centered nature of the religion he represented,[20] that treatise is strikingly short on bibliography to the secondary literature. Augustine writes as a bishop, and *therefore* (by virtue of his ordination) an authority. A hundred and fifty years later, Cassiodorus, a retired statesman living at the monastery he had founded on his family's estate on the remote southern shore of Italy, wrote "Institutes" for the student of scripture.[21] Now it was the private scholar's turn to provide this guidance, and when he did so, his work was little *more* than an annotated bibliography, arranged by books of the Bible, of all that had been thought and said in Latin (or translated into Latin from the Greek, and Cassiodorus had a staff of translators working on increasing the size of that literature in translation) that could help the Christian exegete. To this was added a further bibliography of specialist literature in related disciplines, including the so-called "liberal arts," for Cassiodorus believed that rhetoric and astronomy were useful things for the Bible student to know.[22]

For in the years that had intervened between Augustine and Cassiodorus, the Latin Christian community had learned to depend on texts for many things. Augustine himself had kept a catalogue of the library of his own writings and even written a treatise late in life outlining and defending all the books he had written. Even as a bishop, he was no longer *just* a charismatic preacher, but a man who had a written record to defend. In the same period, Jerome's translation (that would come to be called the Vulgate) had begun to standardize the text of scripture in common use. The library of exegesis, both native and translated, that Cassiodorus could draw upon had boomed in size. Augustine's own *oeuvre*, for example, amounted to over five million words, so much that it was a contemporary and acquaintance of Cassiodorus, Eugippius of Naples, who put together the first volume of "The Essential Augustine," an anthology running to about one thousand printed pages, to help the reader who wanted swift access to the saint's writings. Another acquaintance of Cassiodorus, Dionysius Exiguus, a "Scythian" monk more famous for devising the system of time-reckoning by years BC/AD that is still in use today,[23] found that the Latin churches were often embarrassed by a lack of accurate information about church law[24] and so put together the first collection of what would later be called "canon law".[25]

It is also in this period that the bishops of Rome began to use the exclusive title of *papa* ("pope") and to use the written word and its organized storage to advance their authority. The standard medieval collection of lives of the popes, called the *Liber Pontificalis*, was first written down in the early sixth century, and indeed was written down at first in two

forms, one version produced by each of two sides in a bitter contest over the papal election of 498. In that contest, which stretched out for fifteen years, not only was the official "pontifical book" used as something like a monument and as something like propaganda by both sides, but the prevailing side resourcefully went into the archives and came out with forged documents that supplied suitable ecclesiastical precedent for their claims.

This could only have been done in a world now ready to accept the notion that power depended on defining texts and a world that could expect to have access to such texts. Power of that kind was increasingly centralized and autonomy of the local community weakened. (This is also the period from which survive not only large collections of papal letters, casting their influence over a swath of Europe from Yorkshire to Constantinople, but also *form* letters, that is, evidence of a chancery so busy that it had verbal templates to use. From a slightly later period there comes something called the "Daily Book" (*Liber Diurnus*) of the popes containing just such a collection of form letters. Cassiodorus himself seems to have used form letters in public secular office about the same time, which he collected in his "Various Letters" (*Variae*).)

Similar phenomena appear in this period across a wide spectrum. Take this charming story. One Sunday morning in the fifth century (according to a historian writing about a hundred years later, so perhaps this is best thought of as a story about the world c. 590 AD), bishop Sidonius Apollinaris of Clermont in southern France was going into church to conduct the eucharistic service, when a prankster snatched from his hand the pamphlet (*libellus*) that had written in it the prayers he would use at that service. The point of the story was that not only did he carry off the service with distinction, but the congregation was *surprised* and delighted that he did so – people now *expected* him to be dependent on a text.

As it happens, Sidonius probably wrote what was in that pamphlet himself, but his is the transitional age in which such things were being written down and propagated. Within a few decades of the telling of that story, it would be the norm in a city's large church on Sunday for there to be no fewer than four large books in use at once to guide the service: a sacramentary for the bishop to follow, a lectionary from which a deacon would do scriptural readings, an *ordo* in the hands of the master of ceremonies making sure that people didn't bump into each other, and a gradual (music book) in the hands of the choirmaster. No longer was this the spontaneous early Christian community in which the spirit blessed spoke freely what they knew to be the truth.[26] Now words could be chosen in advance, and not even necessarily by those who would say them. Liturgical participants, even the bishop, were actors in a scripted drama – a vital change. The process there begun would culminate a thousand years later at the Council of Trent in the publication of a missal book for use in churches that would prescribe to the priest not only every word, but even every gesture, and often even which fingers to use for each every gesture of the service. By that time, a large part of the power and the authority of the liturgy was leaving the church building and going into centralized hands.

The pattern is one familiar in a hundred ways. Such centralization is of course both costly and beneficial. What is lost in autonomy and spontaneity is gained (we like to think) in assurance, control, consistency, and predictability. My point is not to decry the development but to pinpoint an important stage in its advancement. It was in the fourth through sixth centuries in the Latin west that our cultural ancestors created a set of software with which to manage their lives. Taken to its most extreme form, this led to small communities organized around a kind of text that Jesus never imagined, the monastic rule. Something like the familiar *Rule of Saint Benedict* or the less well-known and more obsessively orderly *Rule of the Master* can suggest what it was like to live in such a community, but the most important feature of such a text is not what it does but *that* it does what it does: makes the life of a community depend neither on spontaneous choice nor on the orally assimilated customs and wisdom of the past, but rather on specific rules and regulations written down on a page. The Benedictine rule insists that it be itself read out to every novice

several times, and then read out again in pieces to the whole monastic community repeatedly in an endless cycle of renewal of textual authority.

Reliance on texts *implies* that someone will own texts and they will be accessible: ownership and access remain central concerns in all discussions of the present and future of the library. Late antique collections are not very well documented, and that gap in the evidence is to be regretted. There were libraries at Rome under papal supervision,[27] and the monastic collections of Eugippius and Cassiodorus left interesting traces.[28] There is even a vignette from the same Sidonius we heard of a few paragraphs ago describing his own library, with separate seating for men and women; the women decorously surrounded by the works of the church fathers, the menfolk down at the end of the room where the dangerous "pagans" were shelved.

There are as well still collections of manuscripts that have lived together under constant care since the fifth century A.D. in the Latin world. Verona is one place to find a few; the Vatican Library the best place. But our real knowledge of libraries begins to be usable at a later period, the time of the so-called Carolingian Renaissance of the ninth century. Not only are there are *many* libraries, but they are direct heirs of the late antique collections.[29] The selection and ordering of texts closely follows the principles of the fifth and sixth centuries. Cassiodorus' *Institutes* even seem to have functioned as a collection development tool in one monastery, eager to fill out its collection with books he had spoken of;[30] and Augustine's autobiographical listing of his own works was responsible in many places for libraries holding a strikingly high percentage of his works. These collections exhibit a modern, not an ancient, arrangement, placing objective truth at the center of the collection and organizing everything else around it not for beauty but for utility.[31]

The history of books and libraries in the central and later middle ages is abundantly documented and well and widely studied.[32] I will not pursue it here save to mention a familiar tendency. In the centuries *before* printing, there were already coming to the fore the characteristic fear and fascination that flourish in the presence of abundance of information. If 1445 is really the year in which Gutenberg printed his first Bible, it was six years earlier than that when the famous chancellor of the University of Paris Jean Gerson complained that the boom in book production was dangerous. It was giving rise to theological confusion and shaking the solidity of the church's traditional teaching.[33] Little did he know what lay ahead! But already a hundred years before that, one of the most proficient bookmen of the age, Nicholas of Lyra, compiler of a huge and meticulous commentary on all of scripture, itself drawing resourcefully on the library of all the fathers before him, complained that *others* were engaging in similar practices too vigorously. "They have chopped up the text into so many small parts, and brought forth so many concordant passages to suit their own purpose that to some degree they confuse both the mind and memory of the reader and distract it from understanding the literal meaning of the text."[34]

The invention of printing changed many things, and that story has also been told often.[35] But some essential things did not change. Despite massive disruptions, the fundamental community of producers and users of texts remained fairly constant — some ex-monks turned into university professors to be sure (Luther is a prime example), but the continuity of the community of texts was in the main intensified.[36] The codex remained the outward form of the book and the techniques that exploited its power in the late years of an exclusively manuscript culture were enhanced rather than supplanted. Indexes, cross-references, tabulations all multiplied. Many libraries that flourished in the later middle ages still survive today, often at the heart of quite vital institutions. A visit to Duke Humphrey's room in the Bodleian library is a memorable testament to this tenacity. Where there had been disruption in late antiquity and the creation of a new tradition, early modernity had every opportunity and reason to transform its inheritance, but instead turned remarkably conservative in the face of the possibility of chaos. The principal

development of that period for our purposes is that the deliberate emphasis on and systematic reacquisition of Greek and Latin classical literature decisively created the illusion of a tradition stretching back well beyond the late antique origins of the library tradition I have been discussing and incorporating Greek and Roman antiquity in a single traditional continuum.[37] In the wake of the choices made then, I, as a professor of classical studies, am a daily caution to all I meet that we place a remarkably high social value on our links to the past.

But it is not just the temporal dimension that is important. What I am suggesting is that historically, cultures dependent on the written word have all shared the fantasy of the virtual library. That is, they have cherished some notion of total inclusiveness. What they achieve is always far short of anything that might be considered a totality of output of the written word for even a brief period — even the great depository libraries contain only a fraction of the printed reading matter of their own societies), and they have placed a high value on access to that totality. But with this vision, physical institutions have grown up that in one way or another impersonate the virtual library. The public libraries I haunted as a child looked and felt to me every bit as coherently like avatars of the virtual library I already believed in as the academic research libraries I prowl appear to me today. In *both* cases I was indulging a fantasy far from reality, but a potent fantasy nevertheless.

For it is the fantasy that a library's users share that defines the community to which they belong. It embodies a world view (and I have talked about the ways in which the "non-fiction" world view of the virtual library of the age of the codex differed from the "poetic" world view of antiquity) and so seems to give objective confirmation to what our beliefs.[38] In that way it functions importantly as a transmitter of culture from one generation to the next, as it did to me in those public libraries of my childhood.

One other feature is important. The common fantasy of the virtual library encourages the belief that all libraries embody the one ideal form and that they have comparable profiles. And yet precisely when great research libraries try to coordinate their acquisitions strategies, they discover that the overlap in what they buy is far less than what a naive eye would expect.[39]

What of that will survive in the Net community that is coming? The written word itself will see its grasp weaken, as it dances in tandem with visual and aural treasures in great abundance.[40] Other familiar landmarks will diminish. The author is already an endangered species,[41] and rightly so. The notion that authoritative discourse comes with a single monologic voice surely depends on the creation of the written artifact. Both oral discourse (before and beyond the written word) and the networked conversations that already surround us suggest that in dialogue a fuller representation of the world may be found, precisely because conflicting voices deserve to be heard. The notion that reality itself can be reduced to a single model universally shared is at best a useful fiction and at worst a hallucination that will turn out to have been dependent on the written word for its ubiquity and power.

Similarly, the notion that discourse must be fixed to be valid will fade. Now, fixity is to our eyes the only satisfactory guarantee of authenticity, but fixity brings with it rapid obsolescence. There is scarcely a page I have published in a decade and a half of scholarly writing that I would not now change if I could, but I cannot. Words that I know to be inadequate and in some cases untrue continue to speak for *me*, who am no longer the person I was when I wrote them, but I am still somehow their author, I *must* be, because I once was.

With the idea of fixity goes the idea of duration I spoke of earlier. Good words are words that last and remain unchanged. But if the world is constantly in flux, then surely the descriptions of that world should find a way to change to reflect that world. Some of our reference works do this already, and on the other hand Jane Austen is perhaps immune to rewriting and should remain so.[42]

The greatest transformation that such a post-

virtual library information environment will bring us in the way culture is transmitted. If even the idea of a stable, reassuring set of texts and truths on which to nourish the young fades,[43] then it will not be at all clear what it is we need to do to or with our young people to acculturate them to the ways of their elders. For years I have quoted with amusement the poet John Crowe Ransom in an essay on Princeton, where he concluded that all in all Princeton was a fine place, but if he had a son, he would just as soon lock him in a library until he was 21, then send him to Paris. The value of Paris at age 21 remains, I think, about what it was, but even in jest, even as a comic icon, the notion of locking a youth in a library will, I suspect, so far lose its power that people will not even understand what Ransom was getting at. In short, the idea that the totality of our culture can in *some* way be incorporated in a library is precisely what will disappear.

What then becomes of professors and publishers and librarians? If we are very sure we know what our roles are and very determined to work hard to maintain them, we have every reason to look forward to extinction. Confident reliance on old models for such functions will not suffice. There will be traditional publishers and librarians and even professors for a good while, just as there are now professional scribes and schools of calligraphy. But just as the power ran out of the monasteries and ecclesiastical institutions of the late middle ages into new channels and forms, so too our educational institutions *and* institutions are acutely at risk. Those who cherish them will do best to be self-conscious about what they value in those institutions and to be pragmatic about how to pursue the preservation of that value in a rapidly and dramatically changing environment. Paradoxically, this means *not* asking what computers can do in and for our old institutions; it means asking what needs *doing*, and then looking with a clear unprejudiced eye for the best way of doing it. The answer will often be electronic, but the challenge will be to make sure that what the electrons do is indeed valuable to our society. By concentrating on that side of the equation, the people, and even the institutions, who have managed the old information universe have a good chance of finding important roles to play in the new one.

If the virtual library is fifteen hundred years old, why does it seem so current an idea? Will it continue to enthrall? I am fond of quoting McLuhan's notion that the content of a new medium of communication is always imagined to be another older medium.[44] Thus cinema at the outset was thought to be a vehicle for filming "plays", and there are still "made-for-TV movies" and "TV newsmagazine shows". A farmer at the turn of the century saw that the horseless carriage could get him to market and back more quickly, but had no inkling that the same vehicle would send an interstate highway through his pasture and change his way of life forever. It takes a generation or three to get past the point of depending on the old medium for a way to think about the new and to the point of exploiting the new medium artfully in its own right.

The dream of the virtual library comes forward now, I therefore submit, not because it promises an exciting future, but because it promises a future that will be just like the past only better and faster. No one can deny the usefulness of such conceptions, but the limitations of their usefulness must be recognized as well. In another place I hope to write at some length of the critical reactions that the coming of print met in western Europe (for even that innovation was not greeted with an unmixed chorus of praise), but I can share here a main conclusion of that study. It was that all of the criticisms and cautions expressed in the fifteenth and sixteenth century that I can find, characteristically launched from within and usually intended to preserve powerful social institutions, turned out to be accurate and valid. It also turned out not to matter, for the new environment that print created was so much larger, so much faster, and so much more powerful than the manuscript medium had been, that all objections were simply overwhelmed. Where society continued to care about values that the new medium threatened, it turned out that the new medium could easily afford to look after them.[45] I am fond of studying those early critics of the print medium, because they remind me of myself and my friends and colleagues, all of us on the threshold of something new, quite unsure which of our institutions will survive.

The difference, I submit, is that the forms of organization of knowledge in electronic media sharply disresemble those of the traditional codex book. The methods of production and distribution disresemble those of the print media even more sharply. Where the traditional function of the library has been to be one of a few such enterprises cooperating (if sometimes at arm's length) with a few publishers (and thus both together functioning as gatekeepers on a limited set of narrow information pathways from authors to readers), a community is now growing in which there will be as many publishers as readers. The possibility even of imagining totality in such a world rapidly disintegrates. What would be the contents of the electronic virtual library? Everything? Every what? Just to ask the question makes it suddenly obvious that one of the most valuable functions of the traditional library has been not its inclusivity but its exclusivity, its discerning judgment that keeps out as many things as it keeps in. In an information waterfall, the virtual library that tells us everything and sweeps us off our feet with a storm of data will not be highly prized. The librarian will have to be a more active participant in staving off infochaos. If the traditional librarian has been conceived as a figure at home in the discreet silences and cautious dealings of a Henry James novel, now perhaps the right models will be found in James Fennimore Cooper or the Star Wars films: something between Natty Bumppo, the Pathfinder, and the Jedi knight will be the best mascot for a library school.[46] Whether the existing publishing or library communities will supply these pioneers, or whether they will come from some other sector of the information society, is the radically open question of our time for all who care about words and how they affect people. A classicist can only take you so far in examining such issues. His tame projections of the future will certainly be the ones that fall far short of what happens. To find the most sober, pragmatic, and realistic depictions of that future, you would do better to turn your attention to the first wild-eyed visionary cyberpunk sci-fi writer that comes along.[47]

[0]This is the second in a series of studies addressing contemporary issues of networked information in a historical context; the first, St. Augustine to NREN: The Tree of Knowledge and How It Grows, *The Serials Librarian* 23:3/4 (1993), 21-41 (also in *If We Build It: Scholarly Communications and Networking Technologies* [New York, 1993], 21-41, and in *Directory of Electronic Journals, Newsletters and Academic Discussion Lists: Third Edition* [Washington, 1993] 1-11), concentrated on the shaping influence of the codex page and the implicit forms of the organization of information. Here the emphasis is rather on the communities and institutions that organize and use that information.

[1]*Washington Post*, Sunday 21 November 1993, Book World. One expectation implicit in the contemporary dream is that its realization will obviate the need for buildings, but the "virtual library" appeals even to those who are building a very large building indeed. G. Grunberg and A. Giffard, Head Librarian and Head of Informational Services for the new Bibliothèque de France, use the phrase as one of many approximations of the future they sketch in their "New Orders of Knowledge, New Technologies of Reading," in *Representations* 42 (1993), at p. 89. That whole issue of *Representations* is devoted to "The Future Library" and offers a fascinating range of theoretical and practical discussion, centered on but not limited to the Bibliothèque de France, and including an important article by Jane Ginsburg on the future of copyright in an electronic environment.

[2]A news report of October 10, 1984 says of Detroit Tigers catcher Lance Parrish that "his mind is a virtual library of do's and don'ts against most hitters."

[3]*Computerworld* for July 16, 1984.

[4]From a UPI news report, March 6, 1987. A few months earlier, a Chicago *Tribune* story (September 10, 1986) about the French Minitel service seems to use it still in the sense of "virtually a library." With a Minitel one can reserve air flights and hotels, check the

weather, the news, have a virtual library of information at the fingertips and engage in computer conversations with politicians.

[5]I take it as confirmation that when I cited this article in the oral presentation of this paper at the ARL/AAUP Symposium, numerous nodding heads around the room showed that the invocation of this article (which few indeed have read lately!) is a familiar ritual in meetings devoted to the electronic library.

[6]Two points need to be addressed tangentially here, one to recur later. First, how do I happen to have this lovely reference to a yellowed and long forgotten newspaper page? I got it from an article of 1950 vintage by my late University of Pennsylvania colleague Rudolf Hirsch, a widely-regarded student of the history of the book, collected in his *Printing, Selling and Reading, 1450-1550* (2nd. ed., Wiesbaden, 1974). He was already then thinking of the bookless future in a short synthesis on the future of the library forty years ago. Second, note carefully that the function of the new and amazingly fast (even by 1993 standards) technology is presented precisely as a tool for using a traditional, familiar, famously all possessing institutional library of the present. The social and intellectual structures of the present are assumed to be stable and to be a useful basis for understanding the new technology.

[7]Here it is a pleasure to acknowledge the friendly help of Professor Stephen G. Nichols of the Johns Hopkins University's Department of French, whose network of agents finally tracked down a copy of the film for me to screen.

[8]Even a Frenchman would admit that there are more things between heaven and earth than are shelved in the Rue de Richelieu, but the British Library and the Library of Congress (see n. 7 above for one example) are similar foci of ideas of all-inclusiveness that swiftly dissolve under the application of even a moment's thought. (I find the same fixation on the Library of Congress as recently as the January 1994 issue of the relentlessly forward-looking *Wired*, in which Danny Hillis of Thinking Machines is quoted (p. 104) using the LC as a benchmark for available information on line.)

[9]Hear the narrator's voice from the film for a moment: "In an instant, it [the new book in the collection] becomes part of a universal memory, abstract, indifferent, where all the books are equal among themselves, where they all enjoy together an attention as tenderly aloof as that of God for man. And here it is chosen, preferred, made indispensable to its reader, pulled from its galaxy."

[10]Take any reasonable projection of the increase in output of "publication" and extend it over another — what? — thousand years? The cumulated quantity at the end of such a time defies the power of the imagination to conceive it.

[11]This is the letter that tells the story of how seventy translators went into seventy separate cells and emerged months later with seventy identical versions of the text. It was widely retold in antiquity as a story that justified reliance on the Greek text to the exclusion of the Hebrew (and was thus particularly popular among Christians to whom Hebrew was in more ways than one a closed book).

[12]ps.-Aristeas to Philocrates 9: the numbers for library holdings that the letter gives (200,000 in hand, with a goal of 500,000) are of little value, but give a sense of how close to totality a dreamer might think the library came.

I put the word "library" in quotation marks here cautiously but carefully. It is used too readily to apply to entities varying wildly in size and nature, and the common trait of being created and used by people who had similar, but entirely unrealistic, ideas about what they were about should not obscure the fact that the "book" was a different thing to ancients from what it is today (not a text for silent digestion, but a prompt-script for reading aloud; not a source of "information", but chiefly a repository for wisdom coded as poetry and narrative — an *ancient* Dewey Decimal System would not have left "fiction" out of play, it would have placed it at the center of the collection.)

[13]J. Cantora, *The Vanished Library: A Wonder of the Ancient World* (Berkeley, 1989).

is both a readable history of the Alexandrian library and at the same time an exemplification of its curious totemic hold on our culture's imagination.

[14]L.D. Reynolds and N.G. Wilson, *Scribes and Scholars* (Oxford, 3rd ed., 1991), is an excellent introduction to the ancient and medieval making and keeping of books. The "fall of the Roman empire" is a phrase generally avoided by working scholars today in favor of less pejorative (but, notably, still derivative) phrases like "late antiquity." Suffice it to say here that it was a period of great creative energy, for all that some highly visible institutions did not share in that energy.

[15]See here my paper, "From St. Augustine to the NEH's" (n. 1 above).

[16]It is worth noting that the transition through which the written word now moves will be the first to take it from a primary storage material consisting of dried organic material (papyrus reeds, animal scans, cloth- or wood-based paper) to an inorganic substance (for the moment, silicon and magnetized metal).

[17]Constantinople's Byzantine Empire kept the ancient Greek tradition alive until the Turks sacked the city in 1453. The revival of Greek letters in the west in the Renaissance was importantly assisted by the perilous conditions in which Greek scholars in the east found themselves -- see D.J. Geanakoplos, *Greek Scholars in Venice* (Cambridge, Mass., 1962).

[18]The relation between medieval "Latin" and the Romance languages has become a lively topic of discussion since the publication of R. Wright, *Late Latin and Early Romance* (Liverpool, 1982), which argues that from about the ninth century "Latin" was an artificial recreation of something that had in fact died out of everyday use. If true (and I think it is), that theory emphasizes more strongly than ever the way in which the western European tradition was a consciously Latin-centered movement. For the long survival of Latin at the center of the culture, well past the point at which our educational tradition concentrates exclusively on the vernaculars, see I.W. Binns, *Intellectual culture in Elizabethan and Jacobean England: the Latin writings of the age* (Leeds, 1990).

[19]In the conventional literary histories, biased by Romantic expectations of authorial creativity and poetic form, this is dismissed as an age of abridgments, and to be sure abridgments have their weaknesses. But an age characterized by them is *perhaps* one that is discovering itself awash in information and is beginning to take a strong hand in organizing it and making it accessible, surely not a sign of intellectual decline.

[20]I like to speak of Christianity, indeed, as the high-tech religion of late antiquity, for the way it used the written word from the outset to create a community extending across time and especially space, where traditional Greco-Roman religion was quintessentially local and particularist.

[21]See J. O'Donnell, *Cassiodorus* (Berkeley 1979).

[22]Here indeed, I would suggest, is the origin of the cataloguing schemes that privilege "non-fiction". See McKitterick on Carolingian library catalogues, quoted below at n. 30.

[23]Cassiodorus was the first to employ the BC/AD reckoning, but it is really the British monk/historian, the Venerable Bede, who in the eighth century put the system into common use.

[24]For example, in the late 390s, Augustine in north Africa had run afoul of church law enacted at the council of Nicea 70 years earlier by being ordained bishop while his predecessor was still alive, but he had the very good excuse that his church did not have a copy of the relevant decisions and so did not know what the law was.

[25]In so doing, he followed the governmental practice of the same decades that produced an increasingly organized series of collections of secular law, culminating in the huge law-organizing and law-giving exercise of Justinian.

[26]Was spontaneous liturgy still the norm as late as c. 400? The Spanish poet Prudentius in his poem-cycle about the martyrs (Prudentius, *Peristephanon* 10.18) so interprets Mt. 10.19, "take no thought how or what ye shall speak: for it shall be given you in that same hour what ye shall speak," as recommending spontaneity.

[27]H-I. Marrou, 'Autour de la bibliothèque du pape Agapit', *Mélanges de l'Ecole Française à Rome* 48(1931), 124-69, describes the traces of a sixth-century papal collection at Rome.

[28]See again my *Cassiodorus* and on Eugippius, the articles of M.M. Gorman, especially 'The Oldest Manuscripts of St. Augustine's *De Genesi ad litteram*', *Revue Bénédictine* 90(1980).

[29]R. McKitterick, *The Carolingians and the Written Word* (Cambridge, 1989), 165-210.

[30]A case study is W. Milde, *Der Bibliothekskatalog des Klosters Murbach aus dem 9. Jahrhundert. Ausgabe und Untersuchung von Beziehungen zu Cassiodors Institutiones* (Heidelberg, 1968).

[31]In this period, the "classics" were found in a library, if at all, well down the list, subjoined to the basic texts of Latin grammar they presumably exemplified. Professor Ralph Hexter of the University of Colorado has described to me a pattern he is studying where Christian Latin epic poetry held a place of prestige now usually forgotten until well after Carolingian times, until in a very short period the old classics suddenly reared up and took their place, leaving the Christian epics to fall into near total oblivion until a mild revival in recent scholarship took them up again.

[32]See Reynolds and Wilson (n. 15 above); B. Stock, *The Implications of Literacy* (Princeton, 1982); M. Carruthers, *The Book of Memory* (Cambridge, 1989); R. and M. Rouse, *Authentic Witnesses* (South Bend, 1992); M.T. Clanchy, *From Memory to Written Record* (2nd ed., Oxford, 1993); and R. McKitterick (n. 30 above).

[33]Michael Giesecke, *Der Buchdruck in der frühen Neuzeit. Eine historische Fallstudie* (Darmstadt 1991) 175.

[34]Quoted in A. Minnis and A.B. Scott, *Medieval Literary Theory and Criticism c.1100 - c.1375* (Oxford 1988) 269, where there is apt reference made to R. and M. Rouse, 'The Verbal Concordance to the Scriptures', an article now reprinted in their *Authentic Witnesses* cited above. I have heard exactly similar fears expressed by scholars that hypertext links added to their own words will somehow alter and diminish the value of what they say.

[35]In order of publication, the classic studies are L. Febvre and H-J. Martin, *The Coming of the Book* (first in French in 1958, American ed. Atlantic Highlands, NJ, 1976), M. McLuhan, *The Gutenberg Galaxy* (New York, 1962), E. Eisenstein, *The Printing Press as an Agent of Change* (Cambridge, 1979), and M. Giesecke (n. 34 above).

[36]See L. Jardine, *Erasmus, Man of Letters* (Princeton, 1993), for the way in which that assertion of continuity was deliberately contrived and managed.

[37]The textbook idea of the 'Renaissance' is not a simple thing, nor is it the only category that can reasonably be used to describe the period to which the name is usually given, for theoretical considerations, see H. Blumenberg, *The Legitimacy of the Modern Age* (Cambridge, Mass., 1983). The 'Battle of the Books' (so named after Jonathan Swift's influential satire on the quarrel - see now J.M. Levine, *The Battle of the Books. History and Literature in the Augustan Age* [Ithaca, 1991]) comes from a time when serious doubts were raised about the validity and usefulness of maintaining the link to classical antiquity.

[38]What we mean by a 'comprehensive' collection of books, for example, is exactly dependent on who "we" are.

[39]This is demonstrated by contemporary library studies that attempt to 'reduce overlapping' acquisitions by a cooperative process. As soon as objective attempts are made

to see just how large the overlap in current acquisitions really is, the resulting number turns out to be astonishingly low and the prospect for material savings far less than one might have imagined. See P. H. Mosher, "Quality and Library Collections: New Directions in Research and Practice in Collection Evaluation," *Advances in Librarianship* 13 (1983), 211-38, esp. pp. 225-230; a study is referenced in which 87% of titles in SUNY and Cornell libraries were held by one library only. According to Susan Nutter, Director of Libraries at North Carolina State University, the Triangle Research Libraries Network's studies showed that if all duplicate records were eliminated, the size of the combined database would be reduced by only 23.7% (*TRLN Database Overlap Study*, Chapel Hill, NC: TRLN, October 31, 1988). According to an update of that work, of 2,311,331 distinct OCLC control numbers, only 155,116 records occur at all three (Duke University, North Carolina State University, and University of North Carolina at Chapel Hill) major TRLN institutions (May 1992).

[40]I like to imagine the study of American history a thousand years from now, when surely the period before about 1945 will seem vaguely pre-historic, known only from the written word and occasional primitive representations (apart from the 3-D holograph docudramas that will doubtless be produced!), and the introduction of visual and sound recording will give presidents and other historical figures from roughly Kennedy onwards a kind of intensified reality. The resemblance between this period and that in which writing was first introduced is not incidental: see Mott Greene, *Natural Knowledge in Preclassical Antiquity* (Baltimore, 1992), on "prehistory."

[41]Michel Foucault famously asked "What is an author" in his inaugural lecture as Professor in the College de France (avail. in English in his *Language, Counter-Memory, Practice* [Ithaca, 1977]). Here as often elsewhere, contemporary developments in literary theory and allied human sciences parallel, predict, and occasionally mimic, developments in the application of technology with which the theoreticians are often themselves unfamiliar.

[42]I say this even while noting that adding to the canon of dead authors is a recent fad that suggests that some of the intellectual implications of the changes of which I speak are beginning to be felt, to the detriment of the reputations of authors from Jane Austen to Margaret Mitchell.

[43]There is a huge and growing literature arising from the contemporary debate over the place of a "canon" of authorized texts. The most salient feature of such debates is that they are no new thing under the sun, but rather their history is coterminous with that I have sketched here. From the early sixth century AD, for example, we have a list called the pseudo-Gelasian *Decretum de libris recipiendis vel non recipiendis* (Decretal on books to be accepted and books to be rejected), which outlines which books of Christian literature must be read, which may be read, and which should not be read. Exclusion again is an important, if controversial, function in the management of the virtual library of any period.

[44]M. McLuhan, *Understanding Media* (New York, 1964), 8, and often elsewhere.

[45]For example, it was said by one critic that the defect of a printed book was that it resembled all the other copies of the same book, and so you could not check its errors against another copy, the way you could with uniquely individuated manuscripts. True enough, but that critic did not realize that in the print medium it would be possible to pay people simply to proofread, and proofread obsessively if it were a stock offering or legal brief in question, to prevent error in the first place and thus to assure a product of much higher accuracy than anything seen in manuscript culture.

[46]We should also bear in mind that we may already be there in important respects. I could not now give a coherent account of my own working practices in which the transforming and pervasive effect of the computer did not take a central place. True, I still curl up at the end of the day with a traditional codex, but I

am constantly surprised by how much of what I do has changed already, and I am an old-fashioned kind of scholar in a very traditional field. Who the new Jedi knights are and where they are and how long it will be before they are the norm, we only surmise on anecdotal evidence.

[47] I had written this last line in anticipation of meeting Bruce Sterling at the ARL/AAUP symposium. A comedy ensued, when nobody had met the distinguished speaker and we were all creating a kind of composite sketch of what this figure would look like. On meeting this very presentable and indeed almost dapper and soft-spoken man, I think I should confine myself to suggesting here that he is perhaps best described as a "virtual" wild-eyed visionary cyber etc.

Historical Visions and Modern Revisions of Virtual Knowledge

Eugene Vance
Lockwood Professor in the Humanities
University of Washington

The panelists in this session are medievalists. As such, they deal with an epoch of Western culture remote in time yet privileged because it has bequeathed to the modern world many problems which are particularly urgent in our own time. The breakup of empires — first, the Roman, then the Carolingian — in the Middle Ages led to the fragmentation of power and to violent emergence of national cultures, as has occurred in Eastern Europe and Asia with the end of the Cold War in the last decade. Now is also a time of old fashioned holy wars. Judaic, Islamic and Christian fundamentalisms are threatening and toppling secular governments and creating clerical hegemonies. Inversely the European Economic Community is constituting itself as essentially a palimpsest of the maps of the Carolingian Empire and the crusading nations. In the realm of personal experience, the Middle Ages both inherited and nurtured the gender models of the Church Fathers that are being so hotly contested — and defended — today. So too, medieval culture bequeathed to the Western World the twin discourses of romantic love and of misogyny. And just as marriage became a sacrament in the Middle Ages, now church weddings, instead of civil weddings, are once again in vogue. Even the modern clothing of the chic in Paris and New York is harkening back to the robes of the medieval clergy!

More pertinent to our interests in this conference today, however, is the fact that the Middle Ages brought not only literacy to the masses, but new modes of understanding what was written, and with these skills came new personal and political powers.

Thus, as medievalists, we are strangely, if anxiously, at home among many of the social realities of the modern world, including those of electronic literacy and publishing. However, as medievalists, we have two practical modern concerns before us which need to be addressed. First, a distressing one: there is a serious crisis in academic publication in the Humanities, and among its effects is the increasing difficulty for medievalists to share the great wisdom that they possess with all of those who need it so badly but don't know it. Since some of our best scholarship is potentially unprofitable in today's publishing market, it is simply not published; if published it may be so expensive that it is often not purchased even by major research libraries — much less, by individuals.

The second concern is more positive: given the new and yet uncharted potential of electronic publishing, is it not possible for medieval scholars to re-invent (as their medieval forebears once did) the modalities both of the production of scholarly knowledge and of readerly experience of learning?

Since I speak as a scholar to an audience of librarians and publishers, I feel that the first practical concern relates us all to each other, and should be addressed head-on. I shall do so by evoking a case that is hypothetical but painfully detailed. A distinguished press at a large public university, call it North Calibraska, has a 10-year-old monograph series in medieval culture. Its editorial board is well known and maybe even the best that could be assembled. The reviews of its books have been uniformly positive, but funds for publicity have been diminishing, and the books are selling slowly. They have not turned a profit, and the press has suddenly been savaged by the university's board of regents. One day the director of the press writes the following letter to the editor.

Dear Scot

It may be just as well that your hurried schedule at the MLA convention prevented our meeting. I had bad news to deliver that has since become bitter.

Like almost all state universities, North Calibraska University has been going through a series of budget cuts. Last spring, for the first time, the administration had to choose between cutting faculty or cutting budges of auxiliary units, including the Press. We had to absorb a 15% reduction in state support and direct more of our attention to books that sold in the thousands rather than the hundreds. We did cost and income reports on all our subject areas and were forced to suspend two series, including a Scandinavian translation series that had received spectacular reviews.

Last fall the news was worse: we would lose another $150,000 in annual university support, a truly staggering amount. We again reviewed costs and income and identified four series that do not recoup their investments. One of these series is the series on Medieval culture.

This week I was informed that we may take an additional cut of $50,000 this coming fall. The university is well aware that our ability to produce scholarly monographs is in serious peril, but the loss of faculty positions is considered an unacceptable alternative.

In the next year it is likely that we will be required to suspend series that cannot pay their own way with sales or subsidies. The only two titles that have repaid their costs are *The Speech Acts of God* and *The Pilgrimage to Hell*, the two titles with the broadest general appeal. It is no accident that subsequent volumes have not fared as well: each new book is published in an environment less able to afford it. Despite increased marketing, sales for scholarly series continue to fall. Most university publishers report that library standing orders for purchase of scholarly books have dropped about 40%, a drastic decline.

No doubt you will want to discuss this. At present I see very little light amid the gloom.

Unhappily,

Suna Geist
Director, North Calibraska Press

Now suppose that our imaginary series editor is a person quick on his or her feet. Since public university presses are so beholden to state legislators, why not just go ahead and offer this distinguished series to a private university press—indeed, why not go right to the top, nothing less, say, than Prince Hardvale University Press? So off goes a letter, and just imagine our editor's suprise at the perfectly uncynical response it gets.

Dear Dr. Eruguena:

Thanks very much your letter of 1 August and for sending along the admirable collection of reviews. I've had a chance to present the series for preliminary discussion at one of our internal editorial staff meetings. Although my colleagues are favorably impressed by the aims and ambitions of the series as you describe them, we are inclined to believe that the series as presently constituted would not one that we could afford to undertake. Let me explain.

We remain committed to the notion that it is our function as a university press to publish books of exceptional scholarly merit. Since the Press receives no general subsidy, however, our books must pay for themselves through sales (the irony that a subsidized press feels unable to sustain the series has not been lost on us). Yet, as you are aware from your dealings with North Calibraska, economic conditions for academic publishers are

unfavorable at the present time: books are becoming ever more expensive to produce, while book purchases by libraries continue to decline. For these reasons we must be ever more selective in choosing titles for our list.

For these reasons we've also determined that our humanities segment of the list must remain relatively fixed in size. In practice this means that each book we commit to publishing in a given year leaves us with one option fewer we can exercise thereafter. Inasmuch as we always seem to be facing an acute embarrassment of riches, we naturally tend to favor those projects with potentially greater sales appeal over those that are more highly specialized.

Given the size of this organization, and the corresponding operating costs, we simply cannot persuade ourselves that we act responsibly by taking on book projects in the humanities with the potential of selling significantly fewer that 1000 hardcover copies in five years. You suggest, as the reason for the poor showing of the newer books in the series, that North Calibraska "lightpedalled" the publicity. For most monographs, especially those with narrowly disciplinary readerships, promotion beyond a certain minimal level rarely translates into sale.

I've been frank (not to say long winded), and I trust that you'll understand that I've been speaking, and regret having to do so, mainly about financial success, and not about "succes d'estime", which all the books you've published have unquestionably attained. At this university press, I'm afraid, we have little choice but to pursue scholarly ends by increasingly commercial means.

Cordially,

Arch Dumpster
Editor-in-Chief
North Calibraska University Press

So, there you have it: scholarly presses must act like trade presses, and libraries cannot buy expensive scholarly books. But does this hypothetical case apply to good medievalists? Well, I am sorry to say that these letters are real ones, with the names and titles changed, and that a lot of real potential authors, many without tenure, will not survive to produce medieval scholarly books that will become best sellers.

Now it is possible that electronic publishing will someday eliminate this dilemma, and perhaps medieval scholars who write paperless books will soon be more widely read more than ever before. Though it is technically possible to print electronic books that could not make it on paper, those very same prospects should also be taken as an opportunity for scholars to transform their modes of scholarly production in order to reach a new audience, and also to transform their way of relating to that audience. These are questions that must be addressed by all of us, including the scholars of this panel, all of whom have distinguished themselves by publications in their fields that I need not enumerate here, and all of whom have had extensive experience in adapting electronic technology to their fields of study. Kevin Kiernan, Professor of English at the University of Kentucky, has been experimenting extensively with the digital reproduction and transmission of medieval manuscripts, and will demonstrate his results. Michael Fuller, Associate Professor of Chinese at the University of California, Irvine, has also spent several years as a professional programmer, and will speak of ways in which the building of electronic databases of documents of early Chinese culture raises the problem of ways in which modern criteria of selection and ordering relate to the textual order and the priorities of early Chinese culture itself. Mary Wack, Professor and Chairperson of English at Washington State University, is a specialist in Middle English, and will present the results of her efforts to exploit computer based pedagogy to offer to students access to Chaucer's texts, to multi-layered scholarship relating to Chaucer and his time, and to images illustrating Chaucer's

works in their medieval context. David Seaman, Coordinator of the University of Virginia Library's Electronic Text Center, will tour us through an innovative enterprise that makes electronic texts both available to scholars and useful in new and exciting ways.

Digital Preservation, Restoration, and Dissemination of Medieval Manuscripts

Kevin S. Kiernan
Professor of English
University of Kentucky

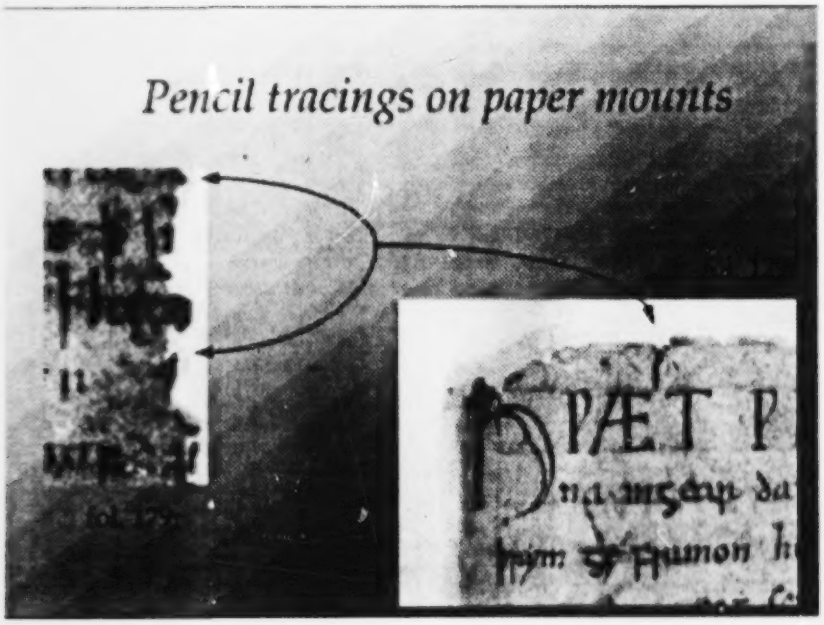
s part of its strategic objectives for the year 2000, the British Library has made a commitment to increase access to its collections by use of imaging and network technology. In the spring of 1993, we began as part of this initiative a big "Electronic *Beowulf*" project, which will in its first manifestation make available in early 1994 a full-color electronic facsimile of Cotton Vitellius A. xv to readers in the British Library and at other selected sites. As this electronic archive grows, it will incorporate facsimiles of many other documents that help us restore parts of the manuscript that were lost or damaged by fire in the early eighteenth century. Plans are already underway, for example, to digitize the late eighteenth-century Thorkelin transcripts of *Beowulf* at the Royal Library in Copenhagen, as well as the first collation of the manuscript with the *editio princeps* of the poem. My presentation today [14 November 1993] is the first public announcement of this project.

The equipment we are using to capture the images is the Roche/Kontron ProgRes 3012 digital camera, which can scan any text, from a letter or a word to an entire page, at 2000 x 3000 pixels in 24-bit color. The resulting images at this maximum resolution are enormous, about 21-25 MB, and tax the capabilities of the biggest machines. Three or four images - three or four letters or words if that is what we are scanning - will fill up an 88 MB hard disk, and we have found that no single image of this size can be processed in real time without at least 64 MB of RAM. In our first experiments in June with the camera and its dedicated hardware, we transmitted a half-dozen images by phone line from the Conservation Studio of the British Library to the Wenner Gren Imaging Laboratory at the University of Kentucky, where identical hardware was set up to receive the data. Most of these images are now available on the Internet through anonymous ftp or Mosaic.

I would like to show you some of the ways in which an electronic *Beowulf* will provide better access to parts of the manuscript than studying the manuscript itself. The unique copy of *Beowulf* is preserved in the Cottonian collection of manuscripts that suffered from a great fire in 1731. It remained in its burnt binding until the middle of the nineteenth century, when Sir Frederic Madden, Keeper of Manuscripts at the British Museum, undertook to restore these damaged manuscripts in his care. His bookbinder first traced the outline of each burnt leaf, cut out the center of the tracing except for a retaining edge of about 2mm, and pasted and taped the vellum leaf to the paper frame. Then he rebound the framed leaves in a new cover. The method well preserved the fragile bits of text along the burnt edges of the leaves, but the retaining edges of the paper mounts, and the paste and tape used to secure the leaves to them, hide from view many hundreds of letters and bits of letters. Today they are visible only if one holds a bright light directly behind them, an ineffectual solution if one lacks the manuscript, the bright light, or the permission to use them together.

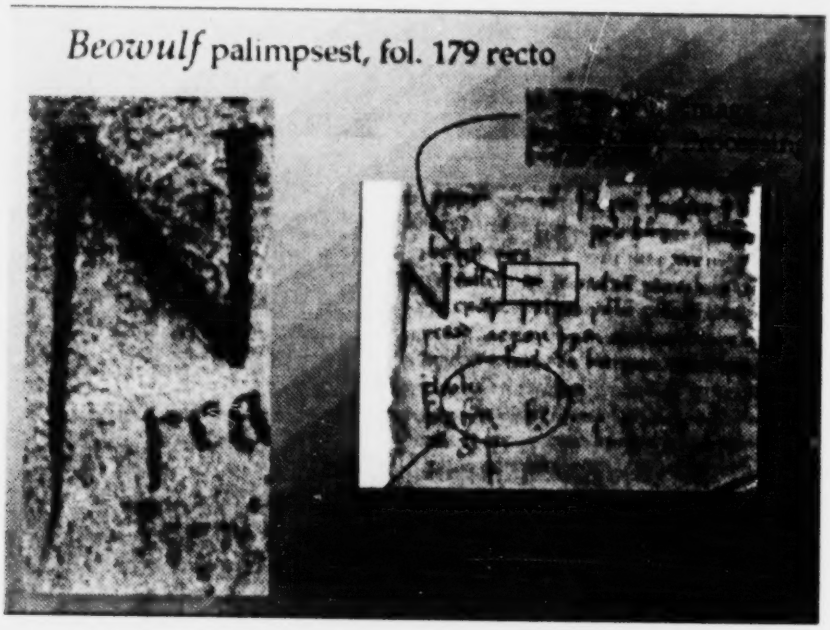
The digital camera at last provides us with a practical means of both revealing and recording these covered letters. The camera easily captures many other features, too, which otherwise require special equipment to see in the manuscript and are difficult or impossible to record in conventional facsimiles. Now, for example, scholars interested in the construction of the original gatherings of the manuscript will be able to place once conjugate leaves side by side again, or examine in great detail the color and texture of the vellum leaves by magnifying the images. Anyone interested in the accuracy and diligence of the scribes, moreover, can investigate all of their erasures, which will be scanned both in bright daylight and with the sometimes more penetrating aid of an ultraviolet lamp. And, with the help of image processing programs, students will even be able to restore or at least improve the legibility of faded passages. Readers of the electronic facsimile will thus acquire a reproduction of the manuscript that reveals more than the manuscript itself does under ordinary circumstances.

The slides illustrating this talk are not, of course, the 21-MB tiff-format image files of the original scans, but only the relatively tiny 100K pic-format image files suitable for the PowerPoint software and Macintosh Powerbook I am using today to project slides. In this first slide the drastically reduced resolution nonetheless shows, among other things, the pencil tracings the binders made on the paper mounts on folios 179 recto and 129 recto, respectively the most damaged page and the opening page of the *Beowulf* manuscript. One can also see the onion skin tape used to hold the vellum leaf to the paper mount and, at the top of folio 129, some slits in the vellum, perhaps made by the binders to help the vellum lie flat prior to pasting it in.



The second slide [see next page] is also from folio 179, which carries a text written later than the rest of the manuscript. Whether the folio is a true palimpsest (with a new text replacing the old one) or simply a freshening up of the original text is disputed. In either case, however, we must face the evidence that we are dealing with a mysterious, but important issue in the history of the transmission of the poem.

Here I have illustrated that simple magnification allows us to detect how the ink in the capital N has failed to adhere to the scraped vellum. The colored block at the top of the slide not only magnifies the illegible text to the right of the N, but also uses brightening, contrast enhancement, and color filtering to sharpen the ink vestiges, which in their enchanced state challenge our traditional reading of this part of the text. The circled area at the bottom of the slide highlights some discoloration caused by erasing between the remaining letters when the vellum was wet. In short, the electronic facsimile will permit us to examine the folio in much more detail than was ever possible in other facsimiles or practical in the manuscript itself.



The indistinct grayscale of the old black and white facsimiles of folio 180 verso obscured the fact that the first three lines were deliberately deleted in the manuscript. In the next slide the facsimile shows by the pattern of discoloration that these three lines of text were for some reason assiduously rubbed out, even though the vellum was not subsequently prepared to receive a new text. If the lines were erased in Anglo-Saxon times, we may have here an incipient revision of the poem. As sometimes happens with the vestigial ink in erasures, the text in these opening lines may be clearer now than it was two hundred years ago, when Thorkelin and his copyist, both assuming they were erased on purpose, omitted them from their copies. No modern editor since Thorkelin has ever drawn attention to the deletion. The editors notwithstanding, it may well be more important to try to figure out why the lines were erased than to enhance their legibility through image processing routines.

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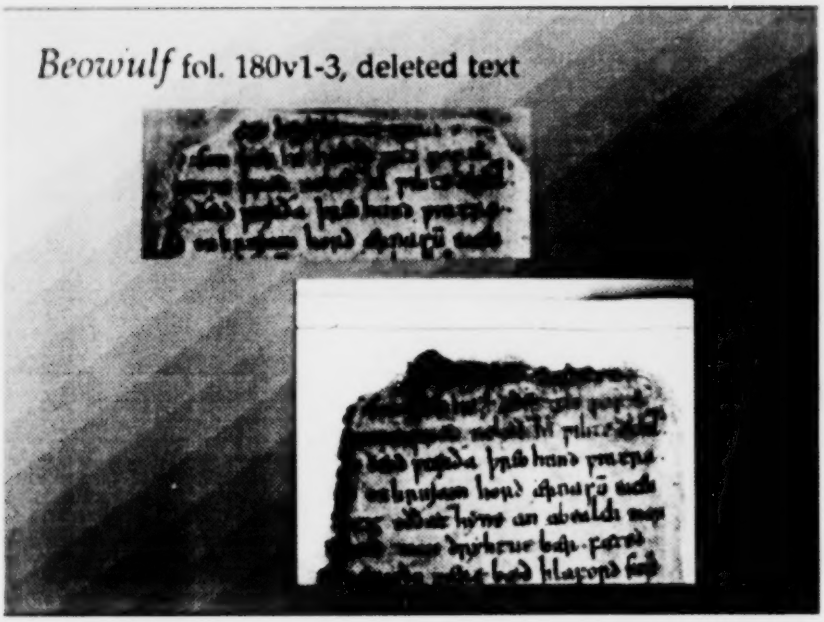
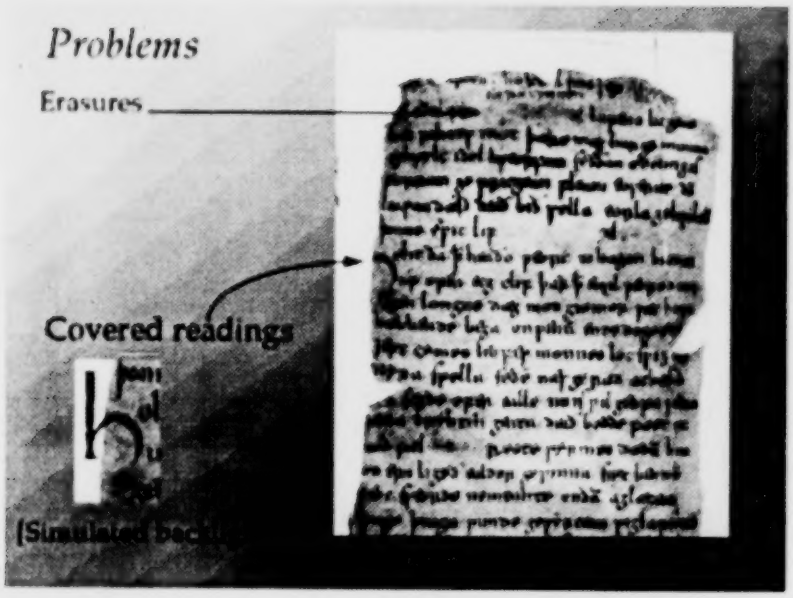
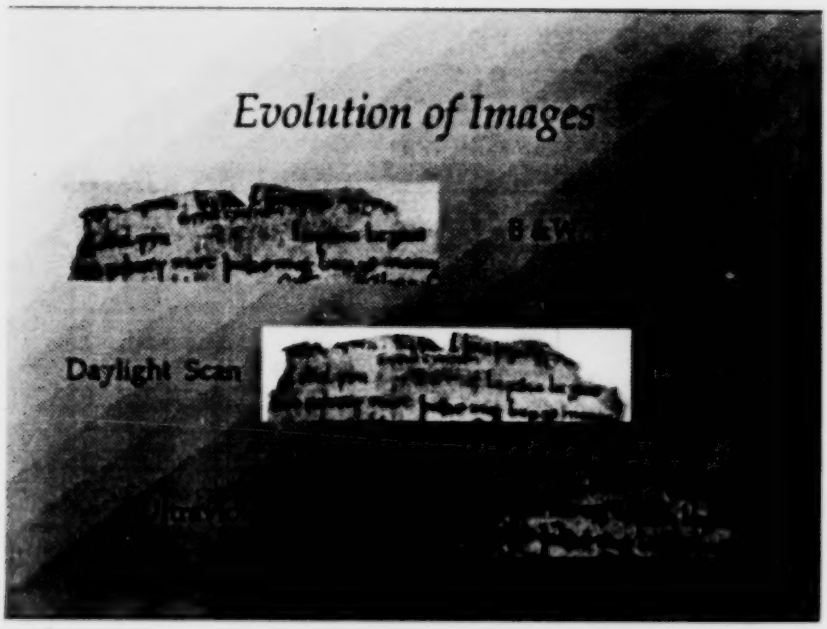


A color scan [see next page] of folio 192 verso in ordinary light reveals several typical problems, in addition to the handful of covered letters along the top and left margins. There is a large erasure in the middle of line 2 with a scribal correction inserted above the line, which overshadows other erasures and corrections in lines 6, 7, 16, and 18. More noticeable than the latter is the bleeding of the ink in lines 3-6. To treat the variety of problems on the page, we scanned it in October 1993 with a bright daylight lamp, with ultraviolet, and with high-level fiber-optic light held behind the covered readings. To illustrate the advantage of backlighting with fiber-optic light, we scanned the page with the covered bar of the big capital H beginning at line 8. The results were all quite gratifying, except that we ran out of hard disk space on the computer we were using for our experiments. The only immediate option we had for saving the ultraviolet and fiber-optic scans was a removeable hard disk I was hand-carrying back to the United States. All of the data was lost in transit, however, presumably when Security at Gatwick Airport in London insisted on separately scanning the removeable hard disk. I therefore concocted a restored H by "simulated backlighting" by moving an H-bar from another part of the manuscript.



This slide illustrates an evolution of our view of folio 192 verso, from black and white to full 24-bit color to ultraviolet scan. The black and white scan (and the black and white facsimile it was taken from) shows little evidence of what was erased in line 2 of the page. The daylight scan, like the manuscript itself in ordinary light, shows more vestiges of the erased material.



17

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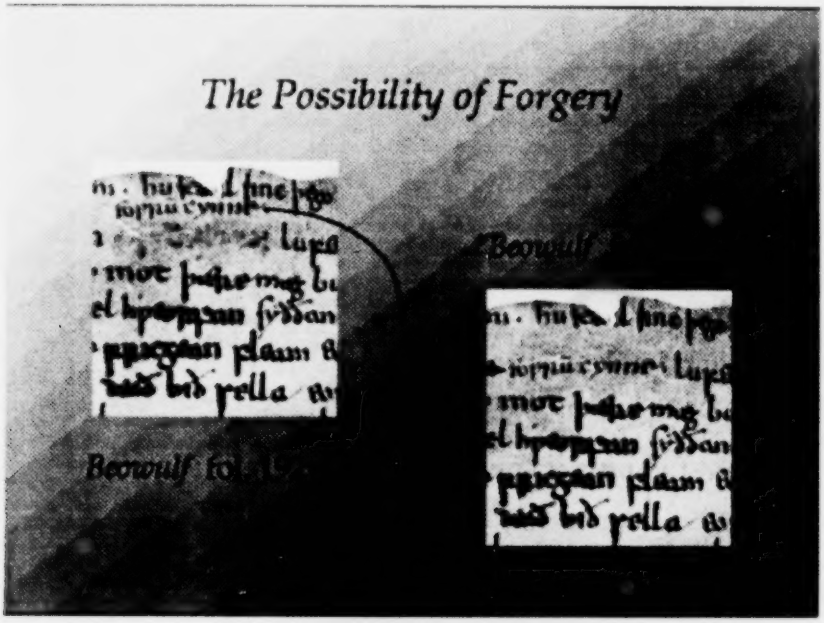
As the first editor of the black and white facsimile noted in 1882, "to judge from the traces, *eorum cynne* was written in the line, ... but [was] erased on account of being even more indistinct" than the damaged words below it in lines 3-6. The ultraviolet scan reveals that the erased reading was indeed *eorum cynne*, with the first e written over a false start. The extensive erasure and correction show as well that the scribe went to special trouble here to transmit a legible text. When it was first transmitted to the University of Kentucky by ftp, this ultraviolet image file arrived totally black, as if it had been destroyed in transmission. The greenish image in the slide was restored by using high-contrast image processing algorithms that stretched the grey range on a 256-point scale from extreme black (0) to extreme white (255). A green filter was added because it appeared to enhance the contrast even more.

As my own simulated backlighting warns, it is important to keep in mind that some of these powerful image enhancement tools are now routinely used in such unscholarly endeavours as advertising, to remove blemishes and undesirable facial hair, for instance, or to straighten a nose or whiten some teeth. With these new tools, in other words, it has become possible to create persuasive forgeries, as in this case, where I have moved the correction from above the line into the line, and replaced the gap with the erased vellum.



In June 1993, using blue light (420-460nm) from liquid light guides connected to a new High Intensity Forensic Light Source in the Conservation Studio, we managed to capture and transmit the first facsimile of a fragment from the Life of St. Sebastian in Cotton Otho B. x (folio 54 verso). The text is invisible in ordinary light and was in fact only recently identified by Stuart Lee with the help of an ultraviolet lamp. The visible portions in the slide read "...godes w..." and "...gen begi...", the only complete word being "God's" in Old English insular script.

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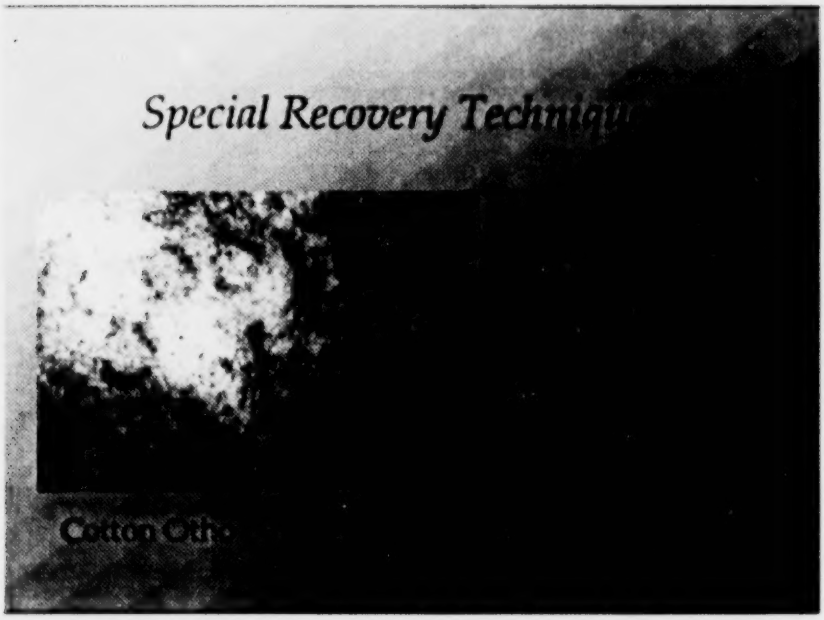

The first published facsimile of this text was transmitted by phone from one UK to another, from the British Library to the University of Kentucky. These few words cost $55 in a phone bill, but at least they arrived intact, unlike the hand-carried images at Gatwick. They seem to portend the start of something really big, expensive, and earth-shattering.

Acknowledgments: The British Library Digital and Network Services Steering Committee oversees the "Electronic *Beowulf*" project and has funded the substantial equipment purchases used in London, while the University of Kentucky has funded equipment and system support for use in Lexington. The staff most closely involved with the project so far have been David Hart and Charles Fischer of the University of Kentucky, John Bennett, an outside consultant, and from the British Library, Michael Alexander of Computing and Telecomms, Dave French and Ann Gilbert of Collections and Preservation, and Andrew Prescott of the Manuscript Collections. Paul Szarmach of the State University of New York at Binghamton and I are the academic directors of the project.

Access by Internet: Readers who wish to see the color slides used for this presentation as well as jpeg files of the original images may access them through Mosaic at either of the following URL addresses:

http://convex.cc.uky.edu, "UK Facts Center"

http://www.uky.edu/ComputingCenter/Welcome.html

(document title is "UK FACTS Center")

Anyone without access to Mosaic may view 15 jpeg files of the original image files through two anonymous ftp sites, beowulf.engl.uky.edu (at the University of Kentucky) and othello (at the British Library). Simply login as "anonymous" with your userid as the password.

[NB: The presentation was done with color images; we apologize for the back and white reproduction here.]

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Chaucer in 2001

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Last year I taught an experimental course nicknamed "Electronic Chaucer" that may offer a glimpse of the sorts of resources to be found in Chaucer classrooms in 2001. I'd like to briefly indicate some of the electronic tools I used, including an image archive, and then discuss some of the issues of publishing such an archive.

The undergraduate seminar in the *Canterbury Tales* made use of a variety of electronic tools available over the Stanford computing network to supplement our printed text and conventional printed resources. The course was taught in a networked classroom in the undergraduate library, where 18 Macs were linked to each other and to the university network. The tools we used over the network included a text search and concordancing program known locally as "The Searcher," an on-line version of the OED, and the *MLA Bibliography* and *Art Index* on networked CD-ROMs. These were prepackaged tools. I did no development of the software or databases. What I did develop was a prototype of the Stanford Humanities Image Archive, a database of digitized images (or "imagebase") with associated texts. This became an interactive resource for the classroom, a research tool for the students, and a project that they contributed to through their own research and writing.

My use of computer tools to teach Chaucer grew out of specific pedagogical problems that I faced. Though I have always felt that computer technology will inevitably transform teaching and scholarship, I felt no personal call to pioneer methods of using computers in the classroom. Like St. Augustine, I said "O Lord, let me learn Hypercard--but not yet." Then a series of impasses in my teaching led me to wonder whether computer technology could offer a way out.

One problem was large class size. I often lectured to classes of 100-200 students. Years of running these courses in the standard way left me dissatisfied with the passivity that large lecture courses seemed to foster, and with the logistical problems of encouraging undergraduate research with so many in the class. The library couldn't handle presentations on rare materials or research tools for that many students in a large group, and didn't have the staffing to schedule presentations for 5 or 7 smaller groups from a single course.

A second problem vexing me was at the graduate level. While many of my students were brilliant and well read in any number of theoretical texts, a disturbing number (to me, at least) who took my medieval seminars could not read the text closely. New Criticism and the study of poetry had apparently been so thoroughly routed from the field in favor of prose fiction and a variety of post-structural theories that very few could analyze a line or a passage of Middle English in any detail--a skill, it seemed to me, still worth having.

A third problem involved the use of slides. I wanted to improve upon slides--which I use heavily as a teaching tool in medieval courses--for a couple of reasons. Since there was no slide library available to non-Art department faculty at Stanford, I had to rely on my personal collection for classroom needs, and my students had access to nothing at all. Until recently at Stanford, there were also significant costs involved in showing slides to large classes--it cost over $100 a shot for someone to unlock projection booths in the large classrooms and set up the machines, making visual presentations very costly.

I also began to feel that I needed to evolve

teaching methods that appealed to students' visual literacy as a means of cultivating greater verbal literacy. If it is true that we are moving toward a post-literate society—as the recent report on national literacy would suggest—then those of us whose business involves literate skills need to rethink our teaching strategies in fundamental ways.

The time had come to see whether computer technology could help me solve some of these pedagogical problems, and over the course of a couple years, the "Electronic Chaucer" course evolved. One exercise I used was based in the playful possibilities offered by powerful word-processing programs. Students chose a portion of the General Prologue to the *Canterbury Tales* and then "illuminated" the text using the typographical palette offered by their word-processing program.[1] (**Figure 1**) Differing fonts, type styles and sizes, and formatting options allowed them to gloss the text through layout and typography. In this way they could offer an interpretation of the text using visual cues, which then served as a starting point for class discussion or for their own more extensive written analysis. The virtues of the exercise are many: it can be a boon to shy students, it appeals to students' creativity, it can be used in collaborative learning groups, it can encourage students to "hear" the text even as they gloss it visually, it prods them into thinking about texts not just as strings of words, but as systems of meaningful signs, some of which are verbal and some not, it can serve as a starting point for a historical discussion of the layouts in medieval manuscripts, and how the disposition of the text on the manuscript page was a part of the communicated meaning. Such an exercise offers an attractive way for students to work actively with the text, allowing them to grapple with the relations between its visual and aural texture and its meaning; it is a concrete way of introducing the idea of form as meaning.

I found, in other words, that the notorious fluidity of electronic text, which presents significant problems for print-based notions of copyright, intellectual property, and publishing, was a great pedagogical boon because it could be made to approximate some of the conditions of pre-print manuscript culture.[2] Like the scribes of medieval manuscripts, each

Figure 1

An Example of "Illuminating" the Text Using Microsoft Word 5.1

A **MONK** ther was, a *fair* for the maistrie,
An outridere, that lovede **venerie**,

A **manly** man, to been an abbot *able*
Ful many a deyntee ¿<<hors>>? hadde he in stable.
And whan he r^Ood, men myghte his brydel heere
Gynglen in a *whistlynge wynd* als **cleere**
And eek as **loude** as dooth the chapel *belle*
Ther as this lord was kepere of the celle.
The reule of Seint Maure or of Seint Benet
By cause that it was old and somdel strit
This ilke Monk leet olde thynges p a c e,
and heeld after the **newe** world the s p a c e

of which presents a unique version of the text, my students were able to manipulate the electronic text to create their own unique versions. While the notion of scribe as author is no longer strange to medievalists, the notion of the student's authorial role with respect to the text will require rethinking customary power relations among teacher, student, and text. I might point out that whereas some of these issues and their implications have been raised by theorists of hypermedia, it doesn't require full hypermedia to arrive at them rather quickly—only Microsoft Word or a similar program.[3]

A more challenging assignment required the students to perform and analyze the results of on-line searches of an electronic version of Chaucer's tales. I should point out that the students used both print and electronic editions of the *Riverside Chaucer*.[4] They bought the print version, published by Houghton Mifflin, while Stanford purchased a site license for the electronic version from Oxford University Press, which had acquired the rights to the electronic version from Houghton Mifflin. Thus the print and electronic editions enjoyed a peaceful coexistence in my class—or so I thought, of which more in a minute. While I have elsewhere discussed the pedagogical success of these assignments[5]—which was notable—that is less important for this forum than the institutional infrastructure that allowed me to offer on-line searching in my classes. The physical location of the class was in the undergraduate library, the machines were obtained through a grant application by the Freshman English program. The physical and institutional location of the electronic edition of the *Riverside Chaucer* was the Academic Text Service of Information Resources. This group was historically and culturally separate from the libraries, though recently it was merged with them organizationally. It took the lead in developing a library of electronic texts, in training faculty to use the search software, and in providing the logistical support for integrating the technology in the classroom and teaching students how to use the software. For me they were the gateway, to use one of the themes of this symposium, to considerably improved teaching conditions.

I also discovered, rather unexpectedly, the **students'** potential role as gate**keepers** in my future choices of editions. When I introduced the Searcher into my undergraduate course, I asked the students to keep journals so that I could track their responses to the program. I discovered—to my dismay—how much they hated the seven-pound *Riverside Chaucer*, which I and other Chaucerians consider a scholarly edition of the highest quality, absolutely packed with notes, glossary, critical apparatus, and bibliography. To them, its physical form conveyed heavy drudgery, the oppressive weight of an obscure language, the mental paralysis of facing a tradition of learning that overwhelmed them. When it was electronically dematerialized, however, they felt that they could approach Chaucer's texts as poetry, and not as a dead language to slog through.[6]

Knowing, as I do now, that the very monumentality of the print edition I have been using works against the goals of the course, I will very carefully reconsider what type of text I will use the next time that I teach an undergraduate Chaucer course. Now that I teach in a state institution, economic issues will figure into the decision as well. At $65, the *Riverside Chaucer* may be a luxury my students cannot afford. While the $100 price tag of the Oxford electronic version is no bargain now, the $300 site license is. I could well envision requiring the students to use a networked electronic text in conjunction with a cheap paperback edition of the *Canterbury Tales*, and then asking them to buy several supplementary books.

When I teach such a course again in 2001 Oxford University Press will have competition for provision of the e-text of Chaucer. By then, Peter Robinson's electronic edition of the *Canterbury Tales*, published by Cambridge University Press in CD-ROM form in a new Cambridge Electronic Editions Series, will be well advanced. The first edition is scheduled to be released in late 1994, with 55 MSS and 4 pre-1500 printed editions of the *Wife of Bath's Prologue*.[7] It will also contain digitized images of all eleven hundred pages of the MSS and editions, as well as full collations and analyses of the manuscript relations, databases of

spellings and variants, and collation and analytic software. Though designed as a research tool, it will have a place in the classroom because it will offer students easy and practical access to primary sources—manuscripts and early printed editions—that are beyond their reach and that of their institutions.

When the course is offered at Washington State in 2001, if all goes according to plan, the students will have access to resources that were unimaginable just a short time ago. From networked classrooms or from their dorms they will be able to search the on-line library catalogue for the entries on electronic editions of Chaucer. They will then be able to call up those editions and search them interactively in the same session. If, say, while reading the *Miller's Tale* they were struck by the image of Nicolas playing his instrument, they could—in the same session—search the catalogue for digitized images of medieval musical instruments and view them. If they were curious about the song that he played, *Angelus ad virginem*, they could search for the relevant catalogue entry and play the song as they studied the images and text.

This will be a full multimedia catalogue and database. The imagebase that I developed was, in comparison, only two dimensional: text and image. However, that relative simplicity allowed me to design and implement the system in a few months with the help of several grants and with technical support from Stanford's Libraries and Information Resources. I used a pair of beta version commercial software programs called ArtAccess and Image Access, developed for collections management at museums and art houses.[8] These programs have the ability to display and manipulate high-resolution color images of manuscripts, art works, maps, and the like. The quality and flexibility in the reproduction of images goes far toward reducing the logistical problems of access to the sorts of objects that medievalists often study (manuscripts, objects in European collections). Such a databases promises both to deepen and to democratize the study of medieval culture in the sense that it opens to the many—undergraduates and the public—possibilities for concentrated engagement with medieval objects more typical heretofore of advanced academic research. Students at geographically isolated institutions, from less cosmopolitan backgrounds, and those with limited library resources, have a chance to work with historical, cultural, and visual materials not otherwise available to them.[9] Unlike the Stanford students, students in Pullman—like most of the rest in the country—don't have the opportunity (usually) to hop down to L.A. for the weekend, and drop in to the Huntington Library to see the Ellesmere manuscript of Chaucer. But an image archive can bring significant pieces of the Ellesmere manuscript *and* Canterbury Cathedral to them, and expand their understanding and appreciation of medieval poetry and culture—or any other non-local culture.

The "imagebase" allows the storage and retrieval of images with up to 35 pages of information, commentary and bibliography attached to each one. The images were digitized from my personal slide collection using PhotoCD and Photoshop.[10] Any kind of image can be entered: manuscripts, architecture, artworks, maps, documentary photos, and so on. The program displays thumbnail images on the screen as though they were slides on a light table. (**Figure 2**) Selecting an image for viewing brings up a record known as "artwork info": a larger image with identifying information. (**Figure 3**) Paging through the record by means of the icon at the bottom middle allows you to select any one of the fields on the second "page" of the record for a greater depth of information about the image. (**Figure 4**) If you wish to learn more about the artist, you click on the button "artist info" and the screen in (**Figure 5**) appears. The imagebase thus allows students access to more information about an image and its context than does the usual classroom slide show given by a non-art historian like myself.

The "image record" containing "artwork info" can also be used to indicate spatial or conceptual relations among images. For example, the record for Trinity Chapel at Canterbury includes "details," which appear as thumbnail images of the stained glass in the chapel. By clicking on the appropriate icon, students can view the stained glass. In a

Figure 4

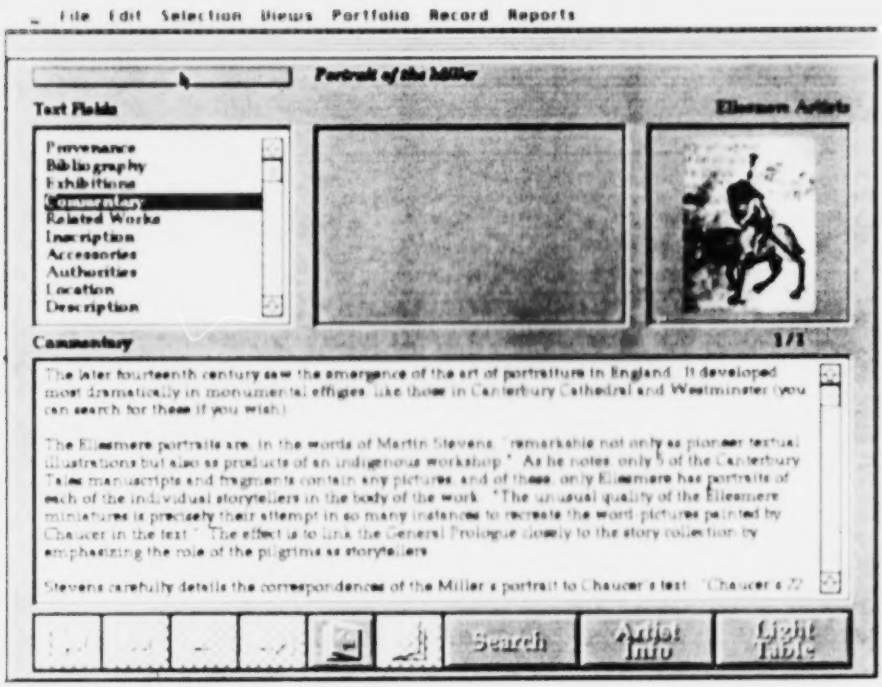
File Edit Selection Views Portfolio Record Reports
Portrait of the Miller
Text Fields
Ellesmere Artists
Provenance
Bibliography
Exhibitions
Commentary
Related Works
Inscription
Accessories
Authorities
Location
Description
Commentary
1/1
The later fourteenth century saw the emergence of the art of portraiture in England. It developed most dramatically in monumental effigies like those in Canterbury Cathedral and Westminster (you can search for these if you wish).
The Ellesmere portraits are, in the words of Martin Stevens, "remarkable not only as pioneer textual illustrations but also as products of an indigenous workshop." As he notes, only 5 of the Canterbury Tales manuscripts and fragments contain any pictures, and of these, only Ellesmere has portraits of each of the individual storytellers in the body of the work. "The unusual quality of the Ellesmere miniatures is precisely their attempt in so many instances to recreate the word pictures painted by Chaucer in the text." The effect is to link the General Prologue closely to the story collection by emphasizing the role of the pilgrims as storytellers.
Stevens carefully details the correspondences of the Miller's portrait to Chaucer's text: "Chaucer's 22
Search
Artist Info
Light Table

Figure 5

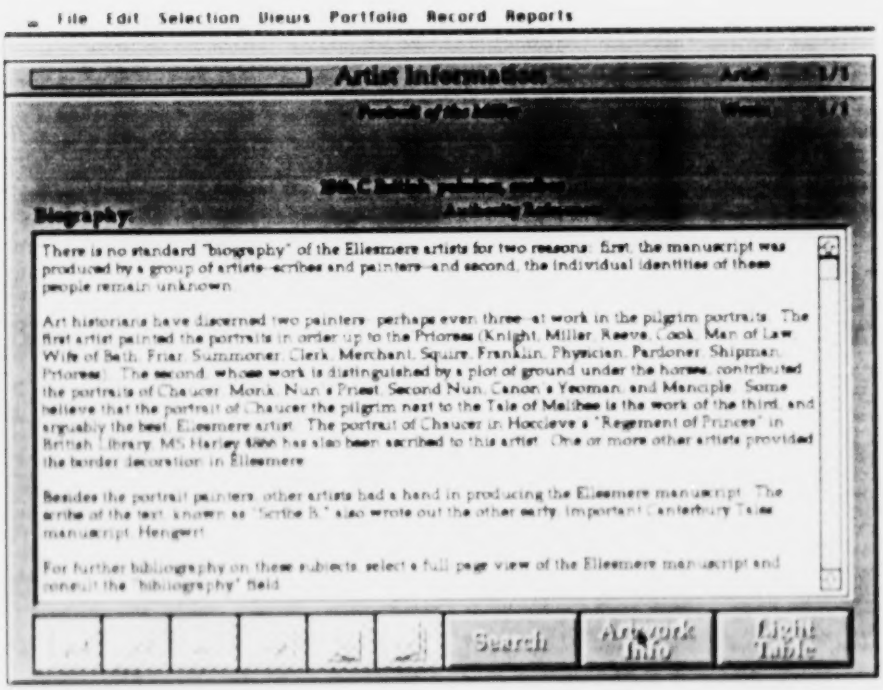
File Edit Selection Views Portfolio Record Reports
Artist Information
Biography
There is no standard "biography" of the Ellesmere artists for two reasons: first, the manuscript was produced by a group of artists--scribes and painters--and second, the individual identities of these people remain unknown.
Art historians have discerned two painters, perhaps even three, at work in the pilgrim portraits. The first artist painted the portraits in order up to the Prioress (Knight, Miller, Reeve, Cook, Man of Law, Wife of Bath, Friar, Summoner, Clerk, Merchant, Squire, Franklin, Physician, Pardoner, Shipman, Prioress). The second, whose work is distinguished by a plot of ground under the horses, contributed the portraits of Chaucer, Monk, Nun's Priest, Second Nun, Canon's Yeoman, and Manciple. Some believe that the portrait of Chaucer the pilgrim next to the Tale of Melibee is the work of the third, and arguably the best, Ellesmere artist. The portrait of Chaucer in Hoccleve's "Regement of Princes" in British Library MS Harley 4866 has also been ascribed to this artist. One or more other artists provided the border decoration in Ellesmere.
Besides the portrait painters, other artists had a hand in producing the Ellesmere manuscript. The scribe of the text, known as "Scribe B," also wrote out the other early important Canterbury Tales manuscript, Hengwrt.
For further bibliography on these subjects, select a full page view of the Ellesmere manuscript and consult the "bibliography" field.
Search
Artwork Info
Light Table

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Figure 2

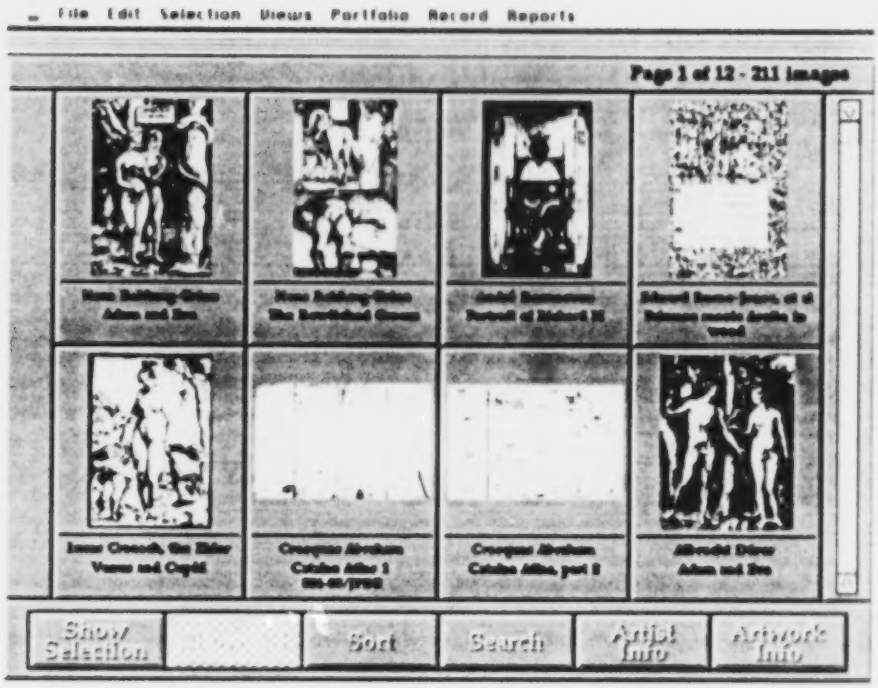
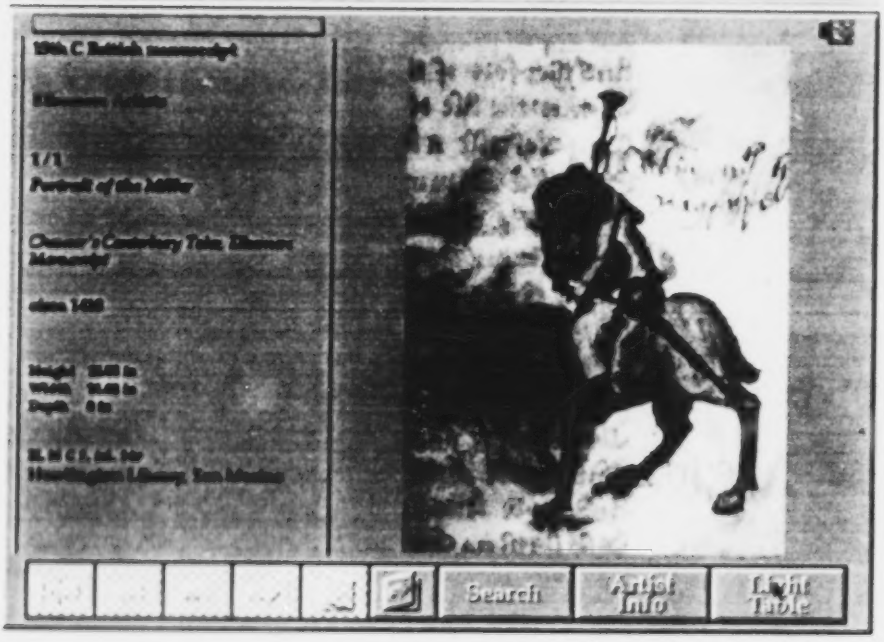


Figure 3



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similar fashion, the pilgrim portraits in the Ellesmere manuscript can be viewed either as details of the full-page view, or as full-record images in themselves. This associative feature could allow an instructor to structure sequences of images for students: for example, a rudimentary guided tour through Canterbury Cathedral.

The program provides other interesting new possibilities for the organization of a body of knowledge. An instructor can create related sets of images for students (called "portfolios") in a matter of minutes; they can be modified or deleted at the click of a button. If students found a certain topic particularly engaging, the instructor could create a custom portfolio on that subject by selecting appropriate items from the full imagebase. Or students could create such portfolios for themselves, to work on over the semester. My current portfolios include, for example, Canterbury, the *Knight's Tale*, the Ellesmere manuscript, and one for materials contained in Stanford's Department of Special Collections. **(Figure 6)** My notion in creating this portfolio was that the imagebase could be a way of mediating between the sheer numbers of large lecture classes and the limited resources of special collections departments. Students can do preliminary browsing and research on the computer, and then follow up with more directed research in the collections themselves. It could also be a way of developing collaborative research between faculty and students in the humanities. Take, for example, the Stanford Chaucer portrait, unknown to Chaucer scholarship; it is a historical mystery whose creation, use, and provenance I am trying to solve. I can place the digitized image at students' disposal, as well as information they can use to develop their own investigations, and perhaps collectively the mystery could be solved more quickly than otherwise. There is an additional benefit, though: technically speaking, the digitization is not of archival quality,[11] it has nonetheless proved to be highly useful since it was discovered that the original was damaged enough to need immediate conservation and little future handling.

Students can also organize knowledge for themselves or take a more active role in their study of the images through the program's search capabilities. The simplest among them, the "QuickSearch" facility, contains a variety of search fields (title, artist, classification, keyword, etc.) with pull-down menus that list the available options. **(Figure 7)** Selecting "woman" from the keyword option produces a "light table" containing the images in the database that I have tagged with the keyword "woman." **(Figure 8)** It can serve as a quick visual essay on the representation of woman in medieval and Renaissance culture. Users can also search by classification, say 15th century British manuscripts, or by collection, such as the British Museum or the Louvre. Having obtained the search results in a matter of seconds, students can then use the bibliography and commentary in individual records as springboards for their own further research.

As the final course assignment, I had students choose an image, research the information to go into the record's fields (provenance, bibliography, commentary, description, artist biography, etc.), and then actually write the record themselves. In this way they practiced (or learned) research skills not often emphasized in English classes; they had to synthesize information into an attractive one or two screen presentation (no one likes to read computer text extensively); and they practiced writing for a public audience of future users of the Image Archive, not merely for the private reading pleasure of the instructor. I wanted them to develop the sense that research is collaborative, interactive, and an on-going process as much as a final product.

If the imagebase is available in a classroom, as it was in a networked Macintosh classroom in the undergraduate library, it can provide powerful, immediate visual information in response to students' questions or problems, making classroom time more visually interactive and productive than is customary now. One of the assignments for the course had students select a page of the Ellesmere manuscript and discuss the literary implications of its layout or *ordinatio*. Though they had read the classic article on the topic, they really didn't understand the concept of *ordinatio*, as became clear during class discussion.[12] With the workstation in the

Figure 6

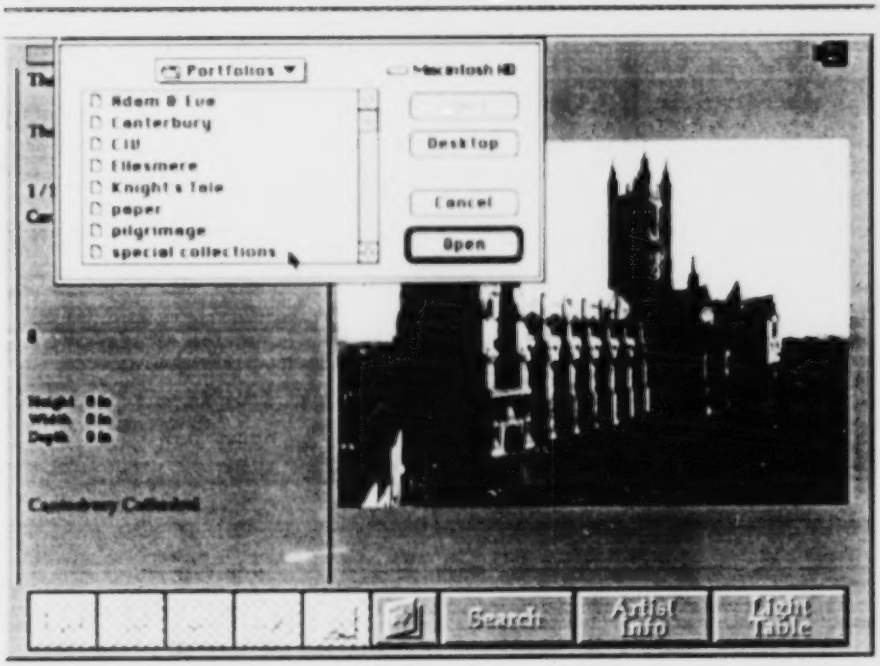


Figure 7

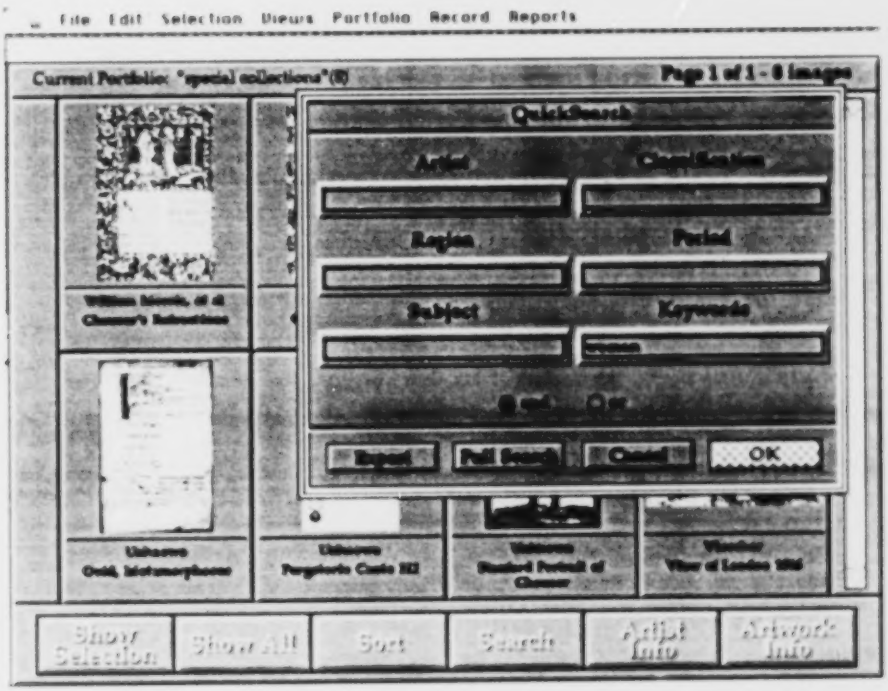
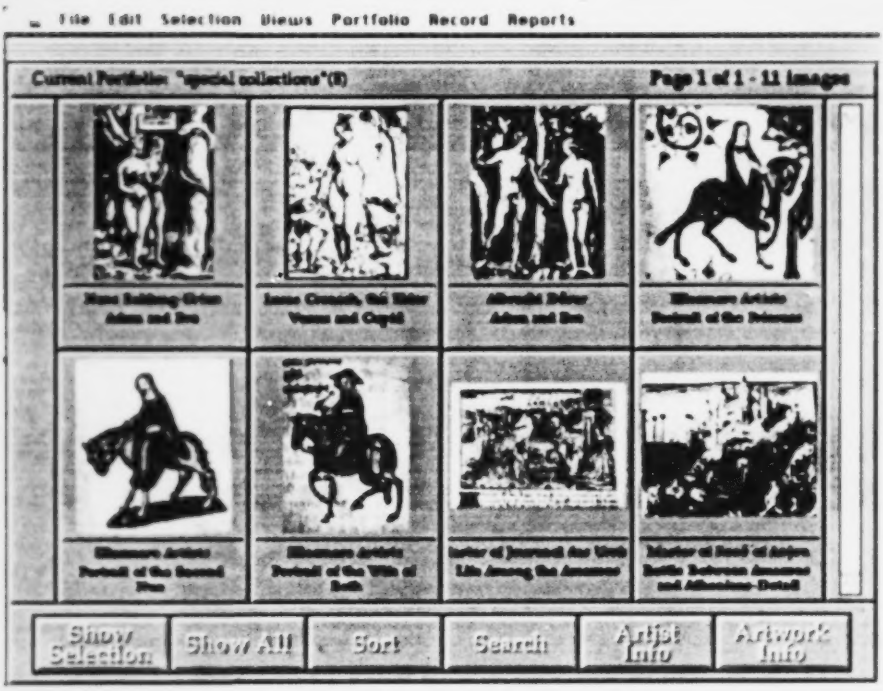


Figure 8



room. I was able during class to show them a page from the Ellesmere manuscript juxtaposed with pages from both the Kelmscott Chaucer and an Ovid manuscript. (**Figure 9**) On the spur of the moment I could illustrate by comparison and contrast how the elements of page design contribute to a reader's interpretation of the text. Without the Image Archive it would have taken me at the very minimum several days to track down the volumes, obtain permission from Special Collections for xeroxing the Ovid manuscript and Kelmscott Chaucer, and then to get the copies back and duplicate them.

The program's ability to juxtapose images on the screen (known as "tiling") allows a flexibility of display beyond the tandem projection of slides. **Figure 10** shows four images representing some aspect of erotic love in the Middle Ages. I have found that my students can "read" such images--that is, decipher their conventions and feel their power--more quickly than they can master the intricacies of equivalent conventions and variations (love as wounding, vulnerability, sickness, death) in a set of four texts. I can thus use such a display to prime their visual imaginations before or as we study literary texts.

The larger file size available in this program allows detailed study of the manuscript as well. You can see details of pen strokes, rulings, painting, etc. This level of image reproduction (4 megabyte file) will allow more serious study of manuscripts than is currently possible in microfilm and most facsimiles.[13]

After I give this demo, the first question people ask is: How can we buy this? That is, when and how are you going to "publish" it? Given their perception of the value of the enterprise, and their lack of resources to replicate my work, the question is reasonable. After all, why should the work be duplicated? Why not conserve collective energies and resources? My answer to the question is that I cannot "publish" it as things stand, because the time investment required to resolve the copyright and software licensing issues is, for me, prohibitive--not even to speak of potential fees involved.[14] Where is the gateway to

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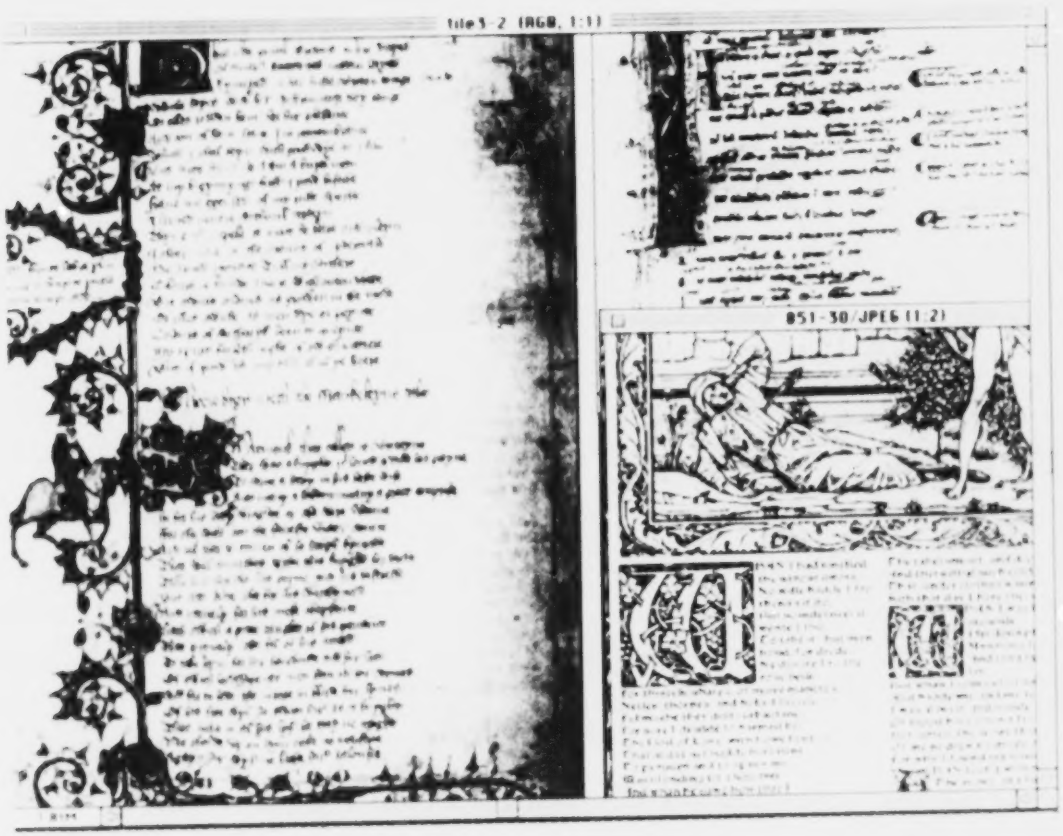
Figure 9

Figure 10



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disseminate such a project? Are there publishers willing to work with faculty authors to negotiate with software companies and with holding institutions for electronic image rights in order to "publish" such a project?

I was much encouraged when I discovered recently that among the consortium of companies backing the New Media Centers Initiative is Prentice Hall. According to a press release, "Prentice Hall, the consortium's founding publishing partner, plays a valuable role in steering debate over practical ways to deal with intellectual property issues, distribution, and royalties in the context of new media, and sharing expertise in the process of turning prototypes developed at *New Media Centers* into viable products for the academic or commercial marketplace."[15] Part of the good news for me was that publishers are getting in on the act. In my limited view of the field, what I have been seeing is that software companies are the ones buying up image rights, developing products, and generally dominating the market. Microsoft's "Art Gallery for the Macintosh" is a case in point. For $80, you can buy a CD-ROM with "access to over 2000 pieces of art in the collection" of the National Gallery, London. There are guided tours of the collection's highlight from art experts, a historical atlas, a "comprehensive glossary" of art and historical terms, the "correct pronunciation of over 750 artists' names," and last but not least, you can "see artists' brush work and other techniques through unique animation sequences."[16] I haven't seen this product yet, and my response is divided: on the one hand, it is better to have it than not to have it. An individual or a library can afford to buy it whereas the comparable art book version would be prohibitively expensive, and it would lack sound and animation. On the other hand, is the quality of the product sufficient for academic purposes? The color is 16-bit, and most users for the next few years will play it on 8-bit monitors, yet the industry standard for serious digital artwork is at least 24-bit color. Will such products shift the role of faculty from being the primary producers of courseware, with technical support from software engineers, to being consultants to software design teams whose primary market is commercial? And given low faculty salaries and high consultants' fees, the market may drive that shift in more ways than one.

Let me throw in another complication to the prospect of "publishing" such an archive: traffic in images over Internet. With the increasing availability of public domain images over Internet, such as the Library of Congress exhibits, why should we bother with the hassles of publishing a select corpus of images from a wide range of institutions? Why not settle for whatever will be available free over Internet?

My demo audiences have posed a second set of questions related to publishing an image archive, questions that focus on gatekeeping roles rather than on gateways. Why, they ask, bother with such a project, why not publish a book instead? How can such a project possibly be linked to your research and publication program? In other words, how can such a project be justified in terms of career rewards, when these rewards in the humanities--hiring, tenure, promotion, salary increases--are based on the cornerstone of book publication? Other concerns are related: how does the academy evaluate the quality of a multimedia publication when the criteria for evaluation, once again, are deeply rooted in the culture of the book? As one colleague put it, a book has a title page with the author's name, the date of publication, and the name of the press. With these the book can be contextualized historically and socially, and the quality of its scholarship can be evaluated or contested in those terms. But how is that done for multimedia publications, which appear to be authorless, dateless, collaborative, open-ended and fluid?

These are the questions of the gatekeepers at the top echelons of the academic hierarchy. Given the assumptions of these questions, it would be a fool or a visionary who published a multimedia work and submitted it for tenure evaluation where such assumptions reign. But that reign may be dated sooner than we imagine, as the young visionaries on our faculties challenge us with such publications more and more frequently, forcing a choice between losing rising stars or re-forging the professional consensus on what constitutes work

that can be evaluated and what the criteria of quality are. As Vartan Gregorian put it in his keynote address last year at the Irvine conference "Technology, Scholarship, and the Humanities" (which I read as an electronic publication of the ACLS over Internet): "The relevant organizational structure must change to adapt to the new technology. Until that happens, the real revolution of technology in higher education will not have happened."[17] In order to make that revolution happen, we need dialogue and partnership with publishers as they work out their own procedures and criteria for evaluating the quality of multimedia publications. Then, were a young Chaucerian to come up for tenure in my department in 2001, we could confidently assess the merit of her multimedia publication, "The Road to Canterbury."

[1] I adapted an exercise called "Illuminated Texts," which I found described in a handout from Ohio State's Program for Computing in Composition and Literature.

[2] For a discussion of the problems presented by electronic text, see the essays in *The Politics of the Electronic Text*, ed. Warren Chernaik, Caroline Davis, and Marilyn Deegan, Office for Humanities Communications Publications Number 3 (Oxford: Office for Humanities Communication, 1993); Paul Delany and George Landow, eds., "Managing the Digital Word: The Text in an Age of Electronic Reproduction," in *The Digital Word: Text-Based Computing in the Humanities* (Cambridge, Massachusetts: MIT Press, 1993), pp. 3-28; and Nancy Kaplan and Stuart Moulthrop, "Seeing Through the Interface: Computers and the Future of Composition," ibid., pp. 253-70.

[3] For example, by George Landow, *Hypertext: The Convergence of Contemporary Literary Theory and Technology* (Baltimore and London: John Hopkins University Press, 1992).

[4] Ed. Larry Benson et al. (Boston: Houghton Mifflin, 1987).

[5] "Chaucer and Hume Meet the Searcher," *Speaking of Computers*, July 8, 1991 (Stanford: Libraries and Information Resources), pp. 1-2.

[6] In "The Places of Books in the Age of Electronic Publication," *Representations* 42 (Spring 1993), pp. 13-37 Geoffrey Nunberg offers a wide-ranging assessment of the implications of electronic publication for the future of the book.

[7] Described in *The Canterbury Tales Project*, Newsletter no. 1 (Oxford: Office for Humanities Communication, August 1993), pp. 3-4.

[8] In point of fact, the programs no longer exist. The original company has split into two: AXS handles ImageAXS, meant primarily for photos, though any digitized image can be used. Digital Collections, Inc. is developing Ark, the successor to ArtAccess, still intended as a collections management tool.

[9] Christinger Tomer, "Emerging Electronic Library Services and the Idea of Location Independence" in Landow and Delany, eds., *Digital Word*, pp. 139-161 surveys some of the issues of "location independence" in a networked "information omniverse."

[10] For an excellent introduction to the issues surrounding digitization, see Peter Robinson, *The Digitization of Primary Textual Sources*, Office for Humanities Communications Publications, No. 4 (Oxford: Office of Humanities Communication, 1993).

[11] For a discussion of archival quality digitization versus "transmissive" level quality, see Robinson, *Digitization*, pp. 14-15 and the projects on pp. 82-94.

[12] Malcolm Parkes, "The Influence of the Concepts of *Ordinatio* and *Compilatio* on the Development of the Book," in *Medieval Learning and Culture: Essays presented to Richard William Hunt*, ed. J. J. G. Alexander and M. T. Gibson (Oxford: Clarendon, 1976).

[13] Note Kiernan's project for 21 mb files of Beowulf.

[14] In order to reproduce materials covered by copyright (i.e., not yet in the public domain) without any risk of incurring litigation, I wrote

letters to each copyright holder. The permission was sought and granted for the course at Stanford. Obviously, publishing the materials in order to distribute them widely would require seeking permissions again, a substantial chore. For a view of the future of copyright, see: Jane C. Ginsburg, "Copyright Without Walls? Speculations on Literary Property in the Library of the Future," *Representations* 42 (Spring 1993), pp. 53-73.

[15]Press release 10/17/93, Cincinnati, OH. Also described in "White Paper."

[16]Microsoft product information sheet, "Features & Benefits," for version 1.0.

[17]Transcript of Keynote address for "Technology, Scholarship, and the Humanities: The Implications of Electronic Information," Irvine, California, Sept. 30-Oct. 2, 1992. Summary of Proceedings (Internet: ACLS and J. Paul Getty Trust, 1993), p. 9.

Gatekeepers of Memory: Issues in the Chinese Efforts to Organize Their Textual Legacy

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Around the year 1200, China had reached a stage in its book culture that in many important ways mirrors our situation today. By 1200, China had been using wood block printing for at least 200 years. By 1200, urban Chinese were at the point of having access to almost the entire textual legacy of their past. At the same time, because of a thriving commercial printing industry, current writings were rapidly disseminated throughout the realm. By 1200, thoughtful Chinese realized that they had achieved infoglut, the inability to meaningfully assimilate all the texts available to them.

What I shall argue today is that the problems Chinese literati encountered in their attempts to organize their textual culture raised the same questions of control we shall encounter in the organization and dissemination of electronic textual information. That is, as information grows ever more massive, it must be organized if it is to be used. But to bring information under control is not and cannot be a neutral act. Control cannot escape questions of power and ideology. By 1200, the Chinese had confronted this reality, and now it is our turn.

Let me begin, however, by filling in a bit of the background of the Chinese development of book culture in order to better explain the Chinese response. There are records of wood block printing of Buddhist *sutras* as early as the seventh century.[1] But to our knowledge, large scale printing projects began around 930, during the Five Dynasties period, when the government of one of the brief dynasties commissioned the printing of the Confucian classics. From 960 onward, the Song dynasty (960-1280), which was to rule over China for 308 years, continued this printing project and greatly expanded its scope. The Song ministry of education printed the Confucian classics, then produced the complete Buddhist cannon on 130,000 wood blocks, then a compendium of the literature of the previous dynasty in 1000 volumes, then the legal codes and the official histories of former dynasties, then pharmacopoeia, Taoist texts, and so on. In this early phase the government tightly regulated the sale and reproduction of these texts. In the meantime, however, commercial printing houses grew ever more numerous and made an ever greater variety of texts available at an ever lower cost. This increasing availability of texts was both symptom and cause of a major transformation in Chinese society and culture. Previous dynasties had been ruled by a bureaucracy recruited from an aristocracy of great clans. Now the great clans were gone, and the dynasty created a meritocracy of officials recruited through competitive examinations that required knowledge of history and literature as well as a grounding in political theory and the Confucian classics.[2] The Song dynasty created the Chinese equivalent of the rags to riches story: a bright young provincial lad could study hard, pass the examinations, and rise to be prime minister. This egalitarian ideal was made possible through the broad dissemination of the texts that were at the center of the exam system. This new egalitarianism, moreover, had an intellectual as well as a political side. Young men without a long family history of scholarship got to study the classics, and they discovered that they *could* read them. They found they could interpret the ancient lore in ways that had immediate implications for their own lives and actions. The minds of the sages, they discovered, survived in the texts themselves, and each individual reader could attempt for himself to understand both what the sages meant and what it meant to be a sage. This was

a heady time of intellectual ferment, but it did not last.[3]

Chinese literati now had access to the broad range of their past traditions. Yet they discovered very painfully that this textual inheritance did not speak with a single voice. From the late 11th century on, the vision of a unified culture based on the sage writings of the past gave way to increasingly strident partisan wrangling. In politics, philosophy, and literature, factions could validate their views with chapter and verse from the writings of former worthies and the historical record of the past.

The orthodoxies that were to dominate the next seven hundred years arose within this cacophony of texts. The instrument used to establish these positions, moreover, was editorial control. The faction that could give the most compelling and useful version of the past, as created through its anthologizing practices, could in essence claim the past. In claiming the past, they in turn controlled the categories through which to understand the present and future as well. The culmination of this process of editorial shaping was the work of Zhu Xi (1130-1200), the great Confucian philosopher, writer, and educator. His *Reflections on Things at Hand* was a collection of the writings of his intellectual forebears that redefined the center of thought for the previous 200 years.[4] In addition, Zhu Xi in his role as educator selected and annotated four texts from the Confucian canon, a set that came to be called simply "The Four Books" that became the center of literati education until modern times. And finally, his annotations of the major Confucian classics provided the orthodox interpretations of those texts for later generations.

The enormous efforts of Zhu Xi and his students gave Chinese literati a coherent perspective through which to read the past as well as to engage in the culture of their own time. We have come to call this perspective Neo-Confucianism, or in Chinese, *dao xue*. The rise of Zhu Xi's *dao xue* marks a major shift in Chinese culture, but its creation of a coherent orthodoxy out of previous cacophony exacted a price from Chinese culture. That is, *dao xue* was not disinterested in its reading of the past: the elevation of some texts and some views required the suppression of others. Not surprisingly, Zhu Xi's contemporaries largely knew what was at stake in these textual matters. When government censors sought to attack the political faction with which Zhu Xi was associated, they branded his writings "spurious learning" (*wei xue*) and proscribed them.

Chinese culture is not alone in finding ideological implications in all texts, from history to philosophy, to commentaries on ancient poetry, to the writing of poetry itself. But in the Chinese case, the connection has an especially long tradition. Indeed, the model for Zhu Xi's shaping of cultural norms through the collation of texts was Confucius himself. According to a very old tradition, for example, Confucius was said to have created the *Classic of Poetry* by selecting the 300 best poems from the 3000 songs used by Zhou dynasty ritualists. These 300 poems to which Confucius gave his assent were therefore studied as embodying sage wisdom and the right use of emotion. Similarly, Confucius wrote the *Spring and Autumn Annals*, a very terse account of events involving the state of Lu over a 250 year period (~770 B.C. to 481 B.C.). Here too, Chinese literati believed that each recorded event implied a judgment and revealed a moral message for later ages. Confucius even was credited by Zhu Xi and other scholars with compiling the ten appendices to the *Classic of Change* to point later readers towards right metaphysics.

So Zhu Xi's contemporaries, who shared this Confucian model, knew the implications of his anthologizing and rewriting of commentaries. Zhu Xi's *particular* genius, however, was the breadth of material that he, like Confucius, could assimilate to his synthesis. Unlike his immediate forebears, who had little patience for belletristic writing, for example, Zhu Xi welcomed it, so long as it made no greater claims for itself than as adornment or rhetoric. Zhu Xi included poetry and literary prose, gave them an honorable place, and thereby controlled them. His coopting of the literary, moreover, was so successful that we only now are beginning to understand what disappeared in the recasting. We only now are realizing that the views of history, self, and the world

embodied in the literary tradition were perhaps Zhu Xi's main rival for the hearts and minds of his contemporaries. We only now, after seven hundred years, realize that his rewriting of the intellectual history of his recent past reduced central cultural figures to bit players and promoted erstwhile eccentrics to the role of philosophic spokesmen for their times. And finally, we just now are beginning to understand how fundamentally the literature of the next seven hundred years evolved within the rewritten history Zhu Xi had provided for it.

In concluding my account of Zhu Xi's editorial work, let me emphasize not its distortions but the fact of its success. His writings created a flexible yet powerful model for how to read, how to engage texts of all sorts from all periods. It committed men to applying their reading to their life in the world and, equally, to bringing reflection on their experience to the reading of texts. This web of words and world left little out. And if nothing could escape the power of its structuring principles, very little could *not* be accommodated somehow. Chinese print culture did not unravel after the Song. On the contrary, it flourished. The volume and variety of printed material continued to expand. And every few generations or so, anthologies were created in philosophy and poetry that once again asserted organizing principles derived in large measure from Zhu Xi that established priorities within the welter of contemporary voices.

As China now begins to make its textual heritage available in electronic form, it not surprisingly begins with a mix of collections traditionally printed by the imperial government and those selections of texts that defined and dominated the traditional discourse about the larger textual universe. As I look to the future, I think we have little choice but to reenact the double movement of the Song government's initial, optimistic project of making useful and important texts available followed by Zhu Xi's strategies for imposing order. That is, we will have to select text initially in accordance with some sense of priorities. It does not matter whether the priorities are conservative or guided by a concern to right old wrongs and give voice to excluded minorities. In both cases, selection *must* be made because of constraints in resources and time, and *all* selections will have ideological implications. Yet let us suppose that the text base gradually grows and escapes the onus of bias. As it becomes broader, it will come to include both the popular and the obscure, the great, the minor, and the utterly trivial. Then our queries of the database will give us more answers than we can hope to properly evaluate. What then? I do not counsel despair, nor do I suggest that we need a new Zhu Xi to organize the priority weighting of the database.

I suggest instead that the allure of Zhu Xi suddenly becomes understandable. An article in the New York Times recently suggested that we need to construct electronic personalities to filter the information for us: the scholar, the libertine, the female mid-town New York lawyer, or even perhaps returning to Zhu Xi the sage. Until we can pick such constructs at will, all we can do is to proceed thoughtfully about our business of making texts available. When the texts are few, pick the *best* principles for selection we can, but know that selection is exclusion. It is power and therefore inescapably ideological. When the text base grows, we confront the same situation at one remove, for we *still* will need weighting procedures that reproduce the process of selection. There are no easy answers here, only provisional ones. There is no way around the need to choose. Indeed, we must specifically reject any promises of coherence that hide the process of selection from view. It remains imperative, I believe, that we live with the question of choice always acknowledged, always before us.

[1] A very good overview of the development of printed texts in Tang-Song dynasty China is Chemiack, Susan "Book-Culture and the Dynamics of Textual Transmission in Late Medieval China." *Harvard Journal of Asiatic Studies*, June, 1994. In writing this paper, I consulted a draft of Chemiack's article and have taken the information in the following paragraphs from it.

[2]See Bol, Peter K. *This Culture of Ours* (Stanford: Stanford University Press, 1992) for a history of the social and intellectual changes from Tang to Song dynasty.

[3]See Smith, Bol, Adler, and Wyatt, *Sung Dynasty Uses of the* ***I Ching*** (Princeton: Princeton University Press, 1990) for an example of the shifts in the reading of the Confucian classics that were part of Song dynasty culture.

[4]For an English translation, see Chan, Wing-tsit, trans. *Reflections on Things at Hand* (New York: Columbia University Press, 1967).

Gate-Keeping A Garden of Etext Delights: Electronic Texts and the Humanities at the University of Virginia Library

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A moment's reflection on our literary heritage brings to mind a plentiful supply of gatekeepers, and rarely is the role an unsullied one: from Guillaume de Lorris to John Lydgate and beyond, medieval gatekeepers cheerfully admit wanderers into morally duplicitous bowers of earthly beauty. Shakespeare's equivocating devil-porter, pissed and pissing, staggers at Macbeth's Hell-Gate, and the execrable shapes of Sin and Death loom large and ghastly at the entrance to Milton's Chaos. As a modern-day gatekeeper to a virtual garden of etext delights I hope to spare my patrons the frustration, shocks, and struggles that literary adventurers often experience in such places, and if — like their medieval counterparts — the modern users find the etexts to be dizzying at first, I hope to be able to parlay this initial headiness into lasting enthusiasm and appropriate use.

Since opening in August 1992, the University of Virginia's Electronic Text Center has tried to exemplify what can now be achieved on a University-wide scale with electronic texts. The Center combines an on-line archive of thousands of texts with a library-based collection of hardware and software suitable for the creation and analysis of text. Through ongoing training sessions and support of individual teaching and research projects, the Library is building a diverse and expanding user community locally and providing a potential model for similar enterprises at other institutions.

The Center is staffed by the Coordinator and a team of graduate assistants, all currently drawn from various humanities departments at the University of Virginia. The staff members have backgrounds in bibliography, undergraduate teaching, textual editing, Special Collections, and graduate research. These skills reflect and support the needs of our patrons, and help us to provide nurturing and training appropriate to users familiar with the texts but often not familiar at all with the computer as a tool for textual inquiry.

Our etext endeavor comprises what may conveniently be thought of as an on-line and an on-site sphere of activity. The on-line component consists of a growing collection of electronic full-text databases, all accessible 24 hours a day by any University of Virginia student, faculty or staff member from anywhere in the world (contractual obligations prevent access by users who lack a University of Virginia affiliation). The Archive currently includes the following items:

- The *Oxford English Dictionary*, second edition.
- The entire corpus of Old English writings (c. 3,000 works).
- Selected Middle English titles (including the *Riverside Chaucer* and works by Henryson, Gower, and the Gawain Poet).
- Hundreds of Modern English literary, social, historical, religious, and philosophical works, from 1500 to the present.
- Smaller selections of French, Latin, and German works.

- The currently released parts of two massive databases from Chadwyck-Healey — J.P. Migne's *Patrologia Latina*, and the English Poetry Full-Text Database.

These texts are not only on-line and available to multiple simultaneous users, but they all use a single common piece of search software. Having been taught to use one database, a user then has the knowledge necessary to search any of our databases. This fact has significant training implications and does much to overcome the frustration and inefficiency involved with CD-ROM based etexts, where each disk typically has a different search tool. Rather than teaching a patron to read a single electronic book, whose rules for access may well differ from the next electronic text collection he or she uses, we are able to teach the user how to negotiate a single software package through which all our electronic texts can be reached.

By buying the data alone, we can also create conglomerations of electronic books that can be searched together — for example, the collection of British philosophy available from InteLex Corp. is a valuable product, but the value is enhanced when these works exist, as they do at U. Va., in a much larger collection of modern English texts. A user can choose to limit enquiries to Hume or to all the InteLex texts, but the user can just as easily remove this limitation and trace an image or concept out into other literary, historical, and philosophical works.

Figure 1 shows an example of such a search, in this case of the portion of the English Poetry Full-Text Database that has been released (about 1,500 works). The search window in the upper left-w hand corner of the screen includes a record of one's past searches, a Key Word In Context (KWIC) concordance of the results (with SGML tags visible), and — in the column headed "Components" — a list of the categories that are marked with SGML tags and that can be used in building a search. The first six searches identify various forms of "gatekeeper" and "doorkeeper." Then, to widen the search, we ask for "gate" plus "door near keeper (by default, near means within 80 characters). These searches are added together, and the "gatekeeper/doorkeeper" set is then limited to 19th-century works only. Running clockwise from the top right-hand corner are display windows showing a variety of 19th-century poems in which the idea of a gatekeeper is represented. The window in the lower left-hand corner shows the poem "First Impressions" with all the SGML tagging made visible.

All the electronic texts are encoded with Standard Generalized Markup Language (SGML). The large-scale electronic text databases — the OED, the Chadwyck-Healey items — come fully marked up, and increasingly we are seeing producers of individual titles (such as Oxford University Press) also offering them in SGML form. The SGML markup not only means that texts can be added together in conglomerations but also that the data, with all its structural and typographic information, is not inherently wedded to a piece of software. It is, in a real sense, data that will outlive the software we currently use to explore and present it.

Those texts that come to us without any markup receive a basic level of tagging at the Etext Center, a task that is aided by the involvement of volunteers from various Library departments under a Staff Sharing program for cross-training. The use of volunteers from within the library in the creation of the etext archive is also an effective way of incorporating this new electronic data service into the fabric of the library. Because there is a danger with such enterprises that they exist in the library but are not really "of the library," we wanted to do what we could from the beginning to integrate electronic texts and print texts. To this end, the catalogers and bibliographers apply their professional skills to the acquisition and bibliographical control of the electronic texts in much the same way that they do with print items. The willingness with which the library as a whole has incorporated the etext initiative has contributed noticeably to the early success of the Etext Center.

The Electronic Text Center provides a place in which to use those texts not available on-line outside the Library. These include CD-ROM products such as *The Global Jewish Database*, *Perseus* (a collection of Greek texts and images), Immanuel Kant's *Gesammelte Schriften*

Thomas Aquinas's *Omnia Opera*, the *CETEDOC* Latin texts, and the *ICAME Collection of English Language Corpora*, and other non-CD texts such as Hegel's *The Phenomenology of Mind*, and *The Tale of Genji* (in Japanese). The Center also makes available hardware and software that permits the creation and analysis of electronic texts, and it provides guidance and training for these new scholarly tools. At present we have MS-DOS machines, a NeXT, a Macintosh, an IBM RS/6000, scanners that turn printed text into computer-readable forms or produce digitized images, CD-ROM drives, large color monitors, and text-analysis software that can generate indices, collations, concordances, word-lists, statistical analyses, and hypertexts. Image-viewing software allows one to work with color and grayscale digital images alongside the searchable databases.

Figure 2 shows an example of an electronic text that is comprised of a digitized manuscript and an SGML transcription. An original letterson letter from the Special Collections Department was digitized in the Etext Center (on screen, the image is in color), and appears here with an enlarged detail in the lower left-hand corner. The image-viewing software gives one the ability to alter the color balance in an image and to enlarge details (the amount of enlargement is dictated by the resolution at which the digital image was scanned). Alongside the image is a searchable transcription of the text (here shown both as it would usually appear and also — bottom left-hand corner — in its "raw" SGML state). The searchable text maintains the lineation and typographic peculiarities of the manuscript (such as the double hyphens for line-end hyphenated words). However, this causes a problem for searching. If the searchable text existed here simply as the transcription, one could not search for the line-end hyphenated words as whole words because (to take the first one) "account" would exist in this letter only as "ac=\|h=count" and would need to be searched for in that form. However, by using a tag called <ref>, which encloses a normalized form of the line-end hyphenated word (<ref>account</ref>) — but does not show up on screen in the text-viewing window (unless the user asks to see all the tags) then one can have a fully searchable version of the manuscript without the need to regularize (and therefore lose) characteristic period or author details such as double line-end hyphens. One could do the same with spelling variants and grammatical errors — in this letter, letterson misspells "received" and misuses "it's," and both could be followed by a <ref> tag. In this letter, SGML tags are being employed to mark off structure, to facilitate searching by the inclusion of regularized forms in addition to the transcribed forms, and (not visible in this example) to record in the searchable text the name and location of the digital image file of the manuscript page.

From its inception, the Electronic Text Center has been alert to the need for on-going user education. It became clear very quickly that it was not enough simply to announce our services and wait for users to arrive, especially as the tools and methodologies offered are still generally unfamiliar to faculty and students. The assumption that "if you build it, they will come" is only partially true. For many users it is more accurately (if more clumsily) stated as "if you expose them to it and support their use, they will come back." In light of this, we contact faculty, feature open houses, teach general and advanced training sessions, offer classes tailored to particular courses, and provide short *ad hoc* sessions to walk-in users in order to train them to some aspect of the service. The training sessions structured to a particular course have been particularly successful, and they mean that the decision to use etexts in a class — often for the first time — does not obligate the faculty member to learn immediately how to teach an unfamiliar set of skills.

The Center continues to give significant time to the creation of on-line and in-print documentation (increasingly, these items are available on the University of Virginia gopher and World Wide Web servers). These documents include introductions to the Etext Center, to the use of the on-line archive (both beginning and advanced sessions), to the off-line texts, and to text creation (including OCR scanning), text formatting (including SGML markup), and text analysis software. We also have something of an education role beyond the University. Because we have received considerable regional and national publicity,

scores of librarians and scholars from other institutions have phoned and e-mailed with queries, and we have seen many on-site visitors, including parties from the following: Harvard, Indiana, Johns Hopkins, Iowa, Duke, Yale, the University of Nottingham, Virginia Tech, Emory, Kentucky, the University of Richmond, UNC Chapel Hill, William & Mary, Oxford, Groningen, Leiden, Macquarie University (Sydney), University College London, and the British Library. We hope that this activity will help foster the development of electronic text services elsewhere, and by so doing to help build a marketplace for e-texts that in turn should encourage publishers to make available more electronic versions of texts for use on-line.

Usage of the etexts and the Center has been heavier and more diverse that we had any right to suspect, a testament to the breadth of the initial holdings and the manner in which the services have been introduced. In 1993 there were over 7,500 remote logins from over 1,600 on-line users, and the Center itself has seen a steadily increasing number of users. A sampling of the on-line and off-line projects undertaken by our users this year are listed below.

- An English professor has added Mrs Sheridan's Lady Sidney Bidulph to the Frances Brooke novel she created last year, for use in a course on 18th-century women writers. These two long out-of-print works are only available to her students as electronic texts.

- Scholars attending an NEH summer seminar made heavy use of the Hebrew bible, the Talmud, and hundreds of books of rabbinical responses on the *Global Jewish Database* CD-ROM.

- Graduate bibliography students have used collating software, image scanning, and digitized sound while preparing and presenting editing projects.

- In Spring 1993, both the Computer Science and English Department used the Center while teaching (both for the first time) etext-related courses.

- A French graduate student has generated cumulative sum analyses and word frequency lists as part of a study of an Ivory Coast writer. Preliminary results were presented at a conference in the Spring of 1993.

- An Education School professor has scanned in sections from dozens of children's textbooks, to examine them as an on-going study of how children are taught language.

- A Religious Studies professor has worked with the InteLex texts of David Hume's writings while researching a book; the InteLex texts have also been used in a philosophy course.

- The *English Poetry Database*, although incomplete, has already brought into the classroom texts not available in print in the library.

- The Center has worked with an English professor to introduce students to the possibilities of hypertext as a tool for presenting and encountering literary texts.

As this service develops and matures, we are seeing electronic texts and related technologies become an increasingly valuable and valued pedagogic and scholarly resource. Scholars quickly understand that electronic documents have several obvious benefits: they can be searched quickly for phrases, words, and combinations of words, allowing one to try out notions and hypotheses with great speed; they encourage large-scale searches over oeuvres, genres, and centuries, searches which are difficult and time-consuming with printed texts alone; they can provide access to texts otherwise unavailable; and they allow such work to be done from one's home or office.

As a gatekeeper to this new realm, I play variously the role of guide, collaborator, cheerleader, and teacher. The lessons of the past 18 months have been clear: that a body of etexts delivered to the user on-line, through a common interface, spurs use in a way that a collection of texts on CD-ROMS in a library

cannot hope to do; that the integration of this new service into the fabric of the library enhances its ability to establish itself quickly; that choosing, handling, and presentation of etexts is a textual as much as a technical endeavor and needs to be done by people with textual and bibliographic skills; and that the users will come and will find increasing use for the various etext services, but they need the ongoing support of gatekeepers who can identify the means of entrance to this garden of delights, demonstrate the enduring value of the contents therein, and facilitate the growth of new uses.

For further information, contact:
David Seaman, University of Virginia Library
phone: 804-924-3230
E-mail: etext@virginia.edu

Figure 1

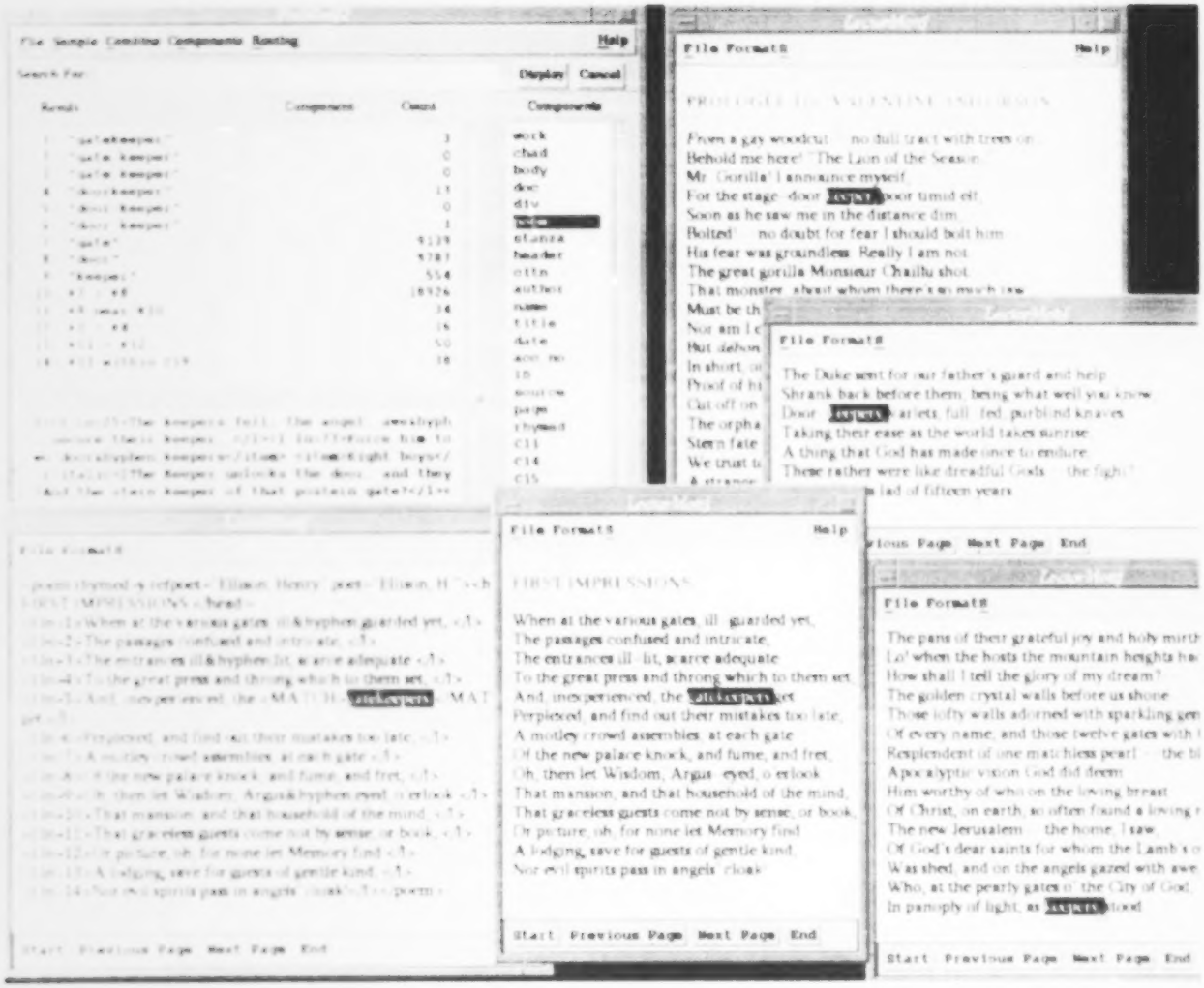
File Format8
Help
Display
Cancel
Search For:
Results
Components
Counts
Components
work
chad
body
doc
div
stanza
header
title
author
name
date
acc no
ID
source
page
rhymed
C11
C14
C15
Previous Page
Next Page
End
FIRST IMPRESSIONS
When at the various gates ill-guarded yet,
The passages confused and intricate,
The entrances ill-lit, scarce adequate
To the great press and throng which to them set,
And, inexperienced, the soldiers get
Perplexed, and find out their mistakes too late,
A motley crowd assembles at each gate
Of the new palace knock, and fume, and fret;
Oh, then let Wisdom, Argus-eyed, o'erlook
That mansion, and that household of the mind,
That graceless guests come not by sense, or book,
Or picture; oh, for none let Memory find
A lodging, save for guests of gentle kind;
Nor evil spirits pass in angels' cloak!
Start
Previous Page
Next Page
End

Figure 2

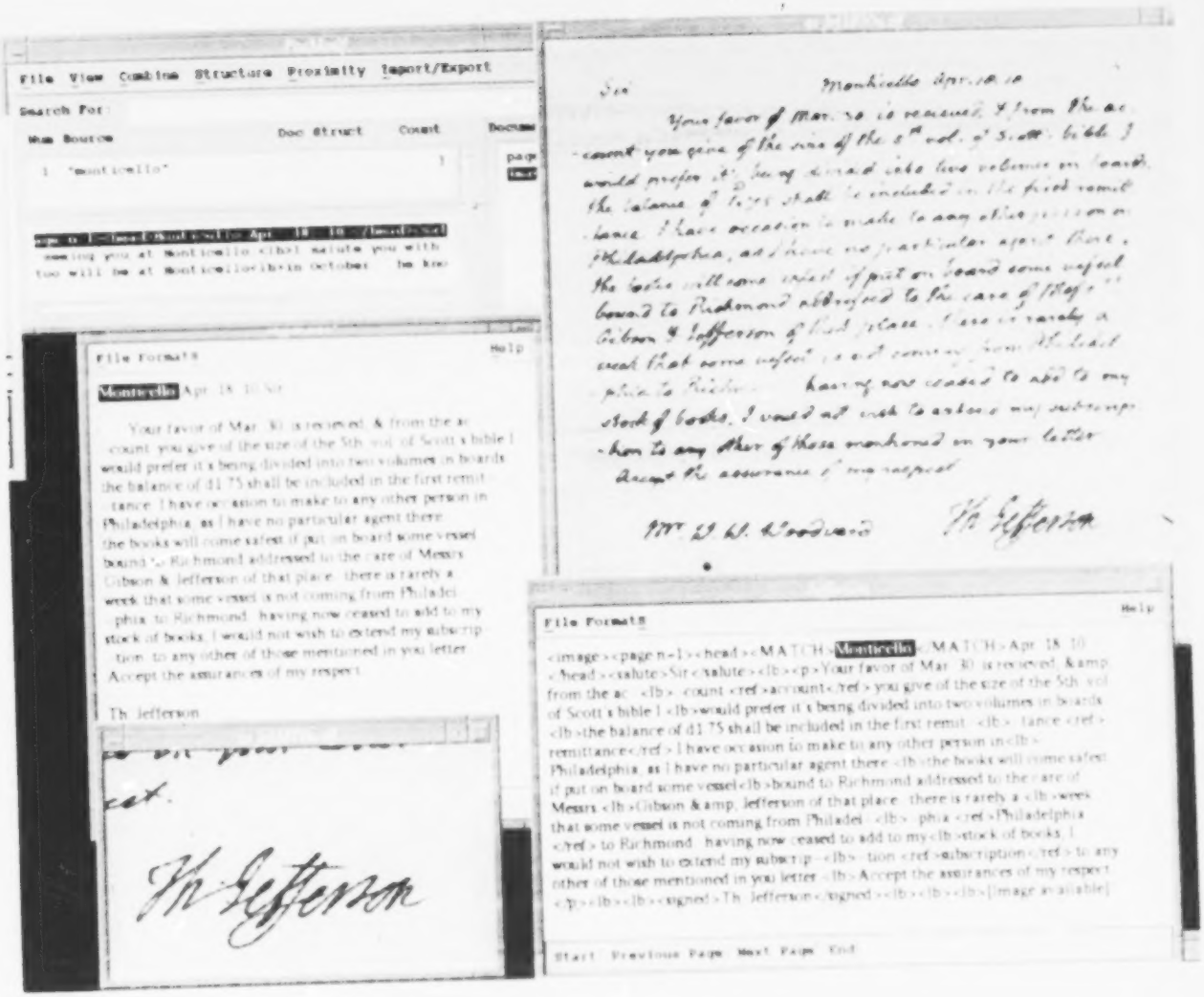
File View Combine Structure Proximity Import/Export
Search For:
Monticello
File Formats
Help
Monticello Apr. 18. 10.
Your favor of Mar. 30 is received. & from the account you give of the size of the 5th. vol. of Scott's bible I would prefer it's being divided into two volumes in boards the balance of d1 75 shall be included in the first remittance I have occasion to make to any other person in Philadelphia, as I have no particular agent there the books will come safest if put on board some vessel bound to Richmond addressed to the care of Messrs Gibson & Jefferson of that place. there is rarely a week that some vessel is not coming from Philadelphia to Richmond. having now ceased to add to my stock of books, I would not wish to extend my subscription to any other of those mentioned in you letter. Accept the assurances of my respect.
Th. Jefferson
Th: Jefferson
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Image Use in Art - Historical Practice

Michael Ester, President
Luna Imaging, Inc

Systems which integrate text and images have long captured the imagination of the art world. Initial experimental attempts using electronic images have since given way to a near explosion of image databases and multimedia projects in related fields. Despite the much needed attention paid to technical issues, there has been little inquiry into the uses of visual resources by art professionals or the ways in which computer systems and electronic publications can be made sympathetic to research practices. Drawing primarily from a study conducted by the Getty Art History Information Program, several considerations of image use are developed in the context of the electronic user environment.

Introduction

When I became Director of the Getty Art History Information Program in 1985 it seemed entirely appropriate that an organization whose mission was directed toward the application of automation in the visual arts should be concerned with developments in computer imaging. Although I previously had been involved in computer graphics and geographic information systems, it was obvious that there were no viable systems available to the art community that offered any immediate promise of practical application for large scale collections. Therefore, about six years ago, we began creating a context where we could explore what it is that people in the arts do with images -- how they use them in their work, and how we should be shaping technology to address the interests of these professionals.

Our basic approach was to set up day-long meetings in which participants could learn about and see key features of image technology, and where they, in turn, could offer their experience in two important areas: their assessment of differences in image quality, and their views and practices of using existing photographic materials. A total of nine such sessions were held at Getty offices in Santa Monica, California, and at the National Gallery of Art in Washington, D.C. Approximately seventy art professionals attended from the United States and Europe. Although the general term "art historian" is used for convenience, the study encompassed a broad range of professionals, including researchers, curators, catalogers, collections managers, photography specialists, visual resources curators, and senior staff of art institutions. Typical of many individuals in the field, participants often divided their time among several of these responsibilities. Although our natural target audience was the art world, much of what we encountered had close parallels in other fields that rely on visual collections.

A more detailed account of the study method and the results on viewer perception can be found in Ester.[1] More recently, I have been speaking about some of the most important outcomes of our work which emerged -- not from our original objectives -- but from encountering unanticipated results in the course of preparing for the sessions. In particular, we found that the image metrics of resolution and dynamic range are insufficient for defining image quality, and that the process of capture is a crucial component in production. This led us to handling some of the most challenging characteristics of art reproductions, and to developing the issues and framework for creating digital archive collections and derivative versions of images for use and distribution.

The context of addressing a mixed audience from the library, scholarly, and publishing communities gives me an opportunity to discuss more fully the third part of our study. In the final session with the participants, we covered the different photographic and print media

they used, the ways they collected and assembled material, and how they employed reproductions in their work. We also explored some of the limitations they encountered with conventional reproduction sources. While an open format was used, the intent was to summarize what was said under recurrent functional themes that could affect the development of electronic publications and their forms of use.

While I cannot cover all of the ground that emerged from these sessions, I can offer a few examples to indicate the range of user issues and implications that seem quite important. Both in the course of covering these points, but more explicitly toward the end of this paper, I want to make a few observations on the suitability of prevailing models for representing and distributing visual collections and associated text information.

Physical Juxtaposition of Images

Consideration of current database systems that incorporate visual materials provides a useful entry into my talk. In these systems images typically exist as a passive field of a text record: finding an object that satisfies certain search criteria and an associated image appearing along with it; alternatively, finding several objects that may produce a screen full of small images. Although the sophistication of interaction, access, and interface vary, this same basic format is nearly a constant. The same static role for images is also true of today's multimedia titles. Regardless of the flexibility or liveliness of the branching interaction, there is a certain inevitability to reaching a destination where an image is locked into a surrounding frame of text.

Yet, one very prominent theme we found is that art historians use physical juxtaposition of images to develop conceptual constructs. Stated simply, professionals use physical arrangements of images as a way to think. Arrangements may reflect stylistic relationships over time, different artistic or historical expressions of a similar theme, separate studies by an artist for an evolving whole, or the visual outline or story board of a scholarly argument. Characteristically, participants recounted diverse methods for ordering material, from tacking images on the wall, to spreading them out on a table, to repeatedly dealing out — like a deck of cards — piles of related photographs according to progressively refined criteria. An electronic system which does not incorporate such features is missing an opportunity to transfer a manual activity, both fundamental and natural to research practice, into the automated environment.

The Problem of Scale

Let me choose the simple problem of scale, both as a shortcoming viewers experience with illustrations and photographs, and as an area where the computer context can offer assistance but can also raise unfamiliar problems. A frequent comment from art historians about reproductions is the way that photographic media homogenize the physical size of art objects into standard print and film formats. Sculpture that appears monumental in a transparency may turn out to be, in fact, quite small. In the common situation in which two slides are projected side-by-side for comparison, it may be impossible to tell that two paintings, for instance, are of vastly different scale. Generations of students have been left with false impressions about object size through the lay-out considerations of popular texts. Something of the significance and limitations of illustrations comes across in experiences, which some of you may share, in confronting a well-studied work of art for the first time having only seen it previously in reproduction. These are often strong remembrances, and commonly evoke the mixed experience of finding the great original initially diminished by its actual smaller size, and yet a sense of rediscovery in the real work of art.

Where might the use of computer images figure into a sense of scale? Fortunately, one of the most commonly documented attributes of an object is its absolute size. Although measurements such as dimensions are not without their problems — for example, was a painting measured with or without the frame — such information is usually present in the description. Access to the measurement values themselves does provide the essential information, but we can have a strong intuitive sense of scale in the context of the

computer display. A screen view of an object outline relative to a fixed scale, or to the size of another object, is a way of giving the viewer this kind of immediate reference point. An approach which the participants voiced themselves was to show the image at the true physical size of the object. Putting aside extreme cases such as standing architecture, participants said this would be extremely useful even if they could only see a portion of the object at actual size which would inevitably occur if the object was bigger than the screen. The potential to visualize the intended scale outweighed the restricted field of vision. I would like to note that the different ways of showing images that evoke strong interest can also be transitory. For example, once having seen an image at object size, there was no particular motivation to continue to work with a full-sized representation for other purposes.

Let me also use the problem of scale to make the point that we still have many lessons to learn about user response to viewing images in a computer environment. Such a situation arose when I was showing an illuminated manuscript page on a computer display to a curator in this particular field. The reaction was a profound double-take: on the one hand, he was captivated by the image quality; on the other hand, there was a strong negative reaction to the "wrong" color which was judged overly saturated and too "hot." These opposing reactions were only heightened as we looked at parts of the page at higher resolutions. However, when we subsequently compared the digital image to the source transparency from which it was derived, we could find no apparent differences. How to account for this contradiction of perceived but not actual difference?

What emerged in the course of further discussion was that the actual page itself was only slightly larger in size than a 4" x 5" transparency, and yet the digital image had been shown unthinkingly at the full dimensions of a 19" monitor. In effect, the manuscript page was seen at an unfamiliar scale that conveyed novel color intensities. Filling the screen with detailed close-ups made the situation worse by presenting even more arbitrary color combinations. When I resized the manuscript image to the actual size of the manuscript page, there was complete satisfaction with the image color. As an afterthought, I asked whether this same problem occurred with projected slides of manuscript pages. The immediate response was that accurate color representation was not *expected* with slides. The strongly persuasive fidelity in the digital reproduction had made the unanticipated sense of color all the more troubling.

Art in Context

If photographs homogenize their subject, a very similar general theme is the problem of art-in-context. Photographic reproductions are an extremely isolating format. The perspective of a sculpture as it was meant to be seen, the syntax and grammar of murals in a church, and the original articulation of furniture in a room are all relationships that are undermined by standard reproductions of the single object. In the human experience of visiting a church, for instance, we are not likely to be eye-ball to eye-ball with a roof top gargoyle, or to look down the nave from the church ceiling.

Perspective views, diagrams, physical models, and the inclusion of scales, etc. are among the remedial solutions often used to compensate for these limitations. Yet recognition of the art-in-context theme and the attendant limitations of photographic reproductions raise several new possibilities in the electronic medium where association, resizing, and arrangement of images in space are particular strengths.

One direction to be approached with considerable caution is the use of computers to generate a third dimension of analysis. Steering a course for effective computer use of three-dimensional space will mean focusing on the objectives for showing spatial relationships and keeping applications simple. Providing convincing 3-D models can be an expensive, processing intensive, and highly labor-demanding proposition, on an order of magnitude of more work for each increment of realism. More tractable solutions for individuals and personal computers would emphasize putting two-dimensional images on flat surfaces and articulating these surfaces in a three-dimensional space. While the effect would be something akin to a building facade in a Hollywood set, the articulation of visual

content and the opportunity to explore different viewpoints would remain intact.

The Use of Visual Materials as a Process

We learned that what art historians may want to do is often dependent on a phase of their research. It is accepted lore that researchers want access to great quantities of visual material and, moreover, that poor image quality is an acceptable trade-off to large volume. This assumption has been one of the arguments for the reason art historians would be content with videodisk publications which provide only television quality but have high image capacity. Participants in our sessions confirmed this impression up to a point. Certainly one of the distinguishing traits of professionals is their extraordinary visual memory; many placed a high value on familiarity with wide-ranging visual materials. It is also common that as they begin a project they want to immerse themselves in as rich and varied a corpus of material as possible. To the extent it could be articulated, this exercise was characterized as a kind of "refresher" in the subject matter or a way of prompting serendipitous discovery.

Yet, it was even more common for art historians to move past this stage, or bypass it altogether, and reverse priorities. Typical of later stages of research, art historians winnow their material to a relatively small working set of images that remains reasonably stable through to the conclusion of a project. A strong premium is placed on image quality for this working set of images. Bringing this understanding back to user design considerations, a system that functions in concert with art historical practice would address research and image use as a *process* with a changing balance of activities and needs. Modes of use and available content should allow the researcher to move effectively through quantities of images and still permit concentrated work on selected groups of images.

While access to reproductions is essential to the training and professional life of art historians, I would mention for balance that we had among our participants art historians who never used reproductions in their research or who needed only a handful of photographs or publications which were readily available. Moreover, participants were very clear that no matter how good a reproduction was it could not substitute for the experience of directly confronting a work of art.[2]

Relationship to Current Directions in Electronic Publications for Higher Education

Against this backdrop of the ways people use visual materials in their work, what are the current directions in electronic media for new publications for higher education? I would maintain that it is by no means inevitable that the arts and humanities will witness image resources comparable to what they currently find today on the shelves of universities and study centers.

To look at one branch of development, I spend a good amount of time at conferences, special roundtables, and demonstrations on multimedia. Several of the media, communications, and computer giants are plowing the rocky furrows of mass interest in new technology with decidedly mixed results thus far. A couple of general observations can be made, however.

- First, these companies are neither directed technically nor are they noticeably interested in higher education or the research community. They and producers of multimedia titles are looking at consumer audiences and would much prefer being offered at Blockbuster Video than in a major university.

- Second, the vast majority of what is called multimedia is really uni-media, in that it consists of video-based stills, motion, and audio. Compare this to current print equivalents — the collections catalogue, the catalogue raisonée, the compendium by artist or theme. The multimedia industry is ill-positioned to address what might be taken as the print standard: the single-page plate in a high quality art book. In a very meaningful way, in terms we know art professionals can appreciate, significant penetration of multimedia

in higher education would dilute or impoverish what already exists.

The technology of multimedia is also innocently misleading as a body of information. If one pulls an encyclopedia volume from the shelf, there is an intuitive idea of the amount information in it and of the larger whole of which it is a part. However, sitting in front of a computer, it is very difficult to know how much information is in a multimedia work. Implicitly, it always represents itself as a major collection with endless branches of access. Yet, all of these works have edges, and are in every way an authored title and not a resource. The very idea of a coherent collection is inappropriate: take away the interactive script, and the images, clips, and sound have no conceptual integrity. Neither as they are captured nor as they are integrated do they represent an accruing body of material. Despite rich navigational aids a user is not searching through a resource collection in the way I have described scholarly activities earlier.

Another important development are initiatives to build national electronic libraries in the humanities. The Getty has been a strong participant in these efforts and there are powerful incentives for the many constituencies involved to move forward. But the idea is almost as basic as wheeling up our libraries to the electronic loading dock and shoveling in all of the books. It has been a considerable effort for us to get people to include primary research materials and visual collections as these are not as tidy or as common as books. More pointedly, there is virtually no thought given to the forms and functional capabilities that should exist for new productions. The ironic implication of this omission is that we may have to create a print publication to know what form the electronic version should take.

Conclusion

Closely related to the issues I have discussed in this paper, the Getty Art History Information Program is initiating an information and standards organization on imaging that will draw on an array of partners from academics, museums, archives, and industry to study the application of this technology in the humanities. There are various issues to consider, including the creation of image archives, clarification of rights and reproductions, documentation of images, technical prospects for imaging, and questions of publication and image use.

At a very concrete level, I have just left my position as one of the directors of the J. Paul Getty Trust to head a new company, called Luna Imaging, which has sponsorship from both the Getty and Eastman Kodak. The company's objectives are to put in place the services, publication resources, and relationships that will build a long-term future for image collections in the visual arts, history, and cultural heritage communities. From the perspective of practical projects, I will mention two of our objectives:

Production. Quite apart from attaining the image quality levels that will continue to serve institutional and scholarly needs, current production practices for capturing images require a radical change in approach if they are to address the very different demands of image *collections*. In the pre-press world, highly trained technicians typically hand-adjust each scan to anticipate a publishing objective. For building digital archives quality must be accompanied by consistency and throughput: consistency to maintain the same image as it passes through a wide potential of systems and devices and throughput to accommodate volumes of images at tolerable cost.

Publication and use. A first project in collaboration with the Frank Lloyd Wright Foundation will produce and publish 5,000 of Wright's presentation drawings and associated documentation; only several hundred of these drawings have ever before been seen. In conjunction with this initial release we are building a visual environment which inverts current emphasis on text, and creates a working context that is at once more natural to the intrinsic character of visual information and builds upon the way professionals use images in their work.

In closing, I would like to leave you with the same key questions that motivated the initial study conducted by the Getty Art History Information Program, that shaped the focus of

subsequent work and presentations such as this paper, and that guided priorities at Luna.

> Will conversion of large photographic collections into electronic form satisfy museum and archive needs, and provide visual resources of lasting value to the field?
>
> Will images be distributed into the academic context, and be of a quality that will serve a broad range of research interests?
>
> Will computer environments complement and support the ways art professionals use visual materials in their work?
>
> Will the path of electronic images lead audiences to interact with the original objects in the institutions that house them?

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The Economics of Electronic Publishing: Some Preliminary Thoughts

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University of Michigan Press

In this discussion of the economics of electronic publishing I will concentrate upon the equivalent of the typical academic book — what we have come to refer to as the long linear document. In what follows, lacking a good brief term for this, I will speak of documents. Although it is the long linear document that is in the forefront of my mind, most of what I will say would apply equally to documents with hypertext and/or multimedia components. And in some parts of the argument those kinds of document display the characteristics about which I am speaking more acutely than do simple documents.

The Reader

We can start from several directions but I want to focus on the most important element in the process — the reader. We must be careful not to allow either the economics or the technology to distract us from the fundamental purpose of the whole endeavor. The point is not words on a screen or type on a page, but ideas in a mind.

So let us focus on the academic reader. The essential characteristics of academic readers are that they are expert and time constrained. As experts they want to make their own choices of what to read, but being time constrained they wish to make their choices of what to read with least time consumed in the selection process, the least time spent reading things that are not valuable, and they want the actual reading process to be efficient and effective.

An academic reader also wants to know about all the important strands of thinking in her discipline, and wants to stay in touch with work in other fields that have relevance to her work. This last consideration is of increasing significance in the fluid world of present day humanities and social sciences. This may be one major factor differentiating the reading patterns of scholars in the humanities and certain social sciences from reading patterns in the sciences.

A century or so ago most of these were not issues. The intelligent lay person could keep abreast of a wide sweep of human knowledge. Now an academic, even with a light teaching load, struggles to keep in touch with all that is written which is of immediate relevance to her work. And no one expects the pace of new writing to slow. Indeed many predictions suggest that the availability of electronic channels for dissemination will have a liberating effect on the productivity of scholars. That is to say, that the easy availability of electronic channels will make more documents available.

Faced with a scarce resource — in this case time to read — an economist argues that the scarce resource has a real value and that misuse of that valuable resource has a real cost. We may not go through a careful process of assigning a dollar value to it, but we should nonetheless aim to use it as parsimoniously as we spend money. In a profession such as the law where the meter is always running, no one has any difficulty in understanding this. When we look inside the academy, this point is much less widely appreciated. No doubt one explanation is that academics usually love their work and thus draw a much looser boundary between work and leisure than do most people. But their days still only have 24 hours like everyone else's — time constrained means time has a value.

So when we think about an academic reader, we are dealing with a resource — her time — with a real economic value. And that fact must guide our exploration of the way a manuscript, via

whatever delivery mechanism, should go from its author to its reader.

The Information Intermediary

In a simple and small world, all authors and readers would have direct contact and documents would move directly from creator to reader. Readers would know authors and their work and decide on the basis of that direct knowledge whether a work was worth their time to read. As the size of the population increases, and as it becomes more dispersed and less homogeneous, that direct method breaks down and a need develops for some intermediation between author and reader.

There may well be disciplines, or at least subfields, where the direct communication model still applies. One can sketch certain necessary characteristics of such a field: small size, relatively low output per scholar, general agreement about the scope of the discipline, and general agreement about quality.

While complete fields of this kind may be rare, there are many disciplines where much of the elite communicates informally through working papers – a form of dissemination that is not intermediated. What is concerning there is the exclusionary consequence. Those not connected to the elite networks tend to be left behind and left voiceless. As we consider the need for intermediaries and their role, broadening access both to readers and authors should be a serious consideration. This is of course a challenge as the selectivity necessary for other reasons can conflict with such democracy.

What are the tasks of these intermediaries? I identify four: gathering, selecting, enhancing, and informing. There are of course at present two main kinds of knowledge intermediary: the library and the publisher, and each of the four tasks has a somewhat different meaning for each intermediary. But one important publisher activity fits outside this schema and deserves a brief mention. Book editors, but also some journal editors, persuade scholars to write works which they believe are needed and would be valuable. In many cases also, the publisher works to persuade a scholar that her work is worth synthesizing into a book length document. I am not going to explore this activity further, but raise it here not only for completeness but also to make clear that the range of material to be gathered in and selected from is not exogenous – it is not purely a given – the intermediaries create and influence what is written in a wide variety of ways.

In the paper world, the four tasks as done by the publisher primarily precede the four tasks performed by the library. This is something of a simplification of the library's full range of work, but it does apply over a wide range of library activities.

Gathering

The publisher gathers in the writings of authors both reactively and proactively. The existence of a large number of publishers permits them to gather writings from a wide range of sources and to provide a quite comprehensive service which saves scholars from having to seek out the works for themselves. This saves scholars time and of course makes possible a much wider catchment area (literally and metaphorically) than any one individual could monitor. Now it may be that in an electronic publishing world, the task of gathering will be eliminated, although I would not expect the facility for seamless worldwide searching to be practical and available to all for some considerable time. There seems likely to continue to be a need for some kind of knowledge intermediary hunting and gathering across the net.

Selection

I choose the word 'selection' rather than 'gatekeeping' because 'gatekeeping' has a passive connotation: it conjures a vision of a flow of people autonomously arriving at a gate and being considered for entry. St. Peter may be assured of a reliable flow of candidates, the publisher feels a definite need to seek them out.

As a publisher considers a new work or proposal, two sets of criteria are applied so that two types of signals can be sent to readers to guide their later reading choices. The first kind of signal is a pure quality one: this work is worth your time to read. The more discriminating the publisher, the more the scholar can trust the signal – and of course that

trust goes back not just to the publisher but to the academics who as advisors and editorial board members steer the editorial decisions of university presses. The second kind of signal is about the kind of work. Most good publishers have an editorial policy: they endeavor to select works of a particular kind even within a discipline. The scholar with certain interests and tastes can therefore know whether what that publisher offers is likely to be appeal. Thus in two ways the publisher's selection process reduces time costs for the reader.

Before I go on, it is time to point out that what I am talking about is value added. I have avoided the term so far, but the time that is saved for the academic reader is a value added service to the reader. Indeed I would posit time saved as one important way of defining and quantifying value added. And of course an entirely media neutral measure.

Enhancement

The third task of the intermediary between author and reader is enhancement. Under this term I include everything that is done to the author's work which changes it before it reaches the reader. This is probably the area where the electronic world will in due course look very different from the present paper world. However amongst the functions that will in some form carry over are editing (revise and resubmit is surely media independent), copyediting, or some components at least of that activity, and design – the formatting of material to make it easy to read, easy to navigate around, and generally to make it an effective device for conveying the message of the document. As we redefine this general task of document enhancement – whether it be traditional style copyediting, the provision of hypertextual links or integration of multi-media, the dominant question will have to be about the relationship between cost incurred and value added.

Informing

Finally there is the task of informing potential readers – what is vulgarly called marketing. Some believe retrieval tools will make this unnecessary. Considering the complex interest matrices in the humanities, I suspect that many scholars will continue to welcome a contribution to the process by active knowledge purveyors and will not want to rely completely on the passive knowledge/active seeker model which is so often implicit in predictions of the future. That the methods and mechanisms employed will change, indeed are changing, is undeniable.

Library Value Added

Turning now to the definition of these tasks for the library, I must be much more cautious given my lack of relevant expertise. So a few brief comments. First, although payment for value added is interestingly absent from most of the library world, clearly we must think of the library tasks within the same framework of benefits, especially time saving benefits, for scholars. While the publisher gathers and then selects from the manuscript universe, the library has traditionally selected from the universe of publications works that have survived the publisher selection process.

We might ask the rationale for this two stage process. There are I think two reasons. First the publishers provide a multitude of entry channels and thus ensure there is no monopoly of ideas. But second there are considerable economies of scale in the selection process: one publisher discriminates for many (indeed all) libraries. The economies of scale argument is reinforced by the decisions of most libraries to use vendor systems to reduce to manageable proportions the number of publications from which they have to choose. The vendor rather than the library gathers and does a partial selection.

At the library level, enhancement is very different. It tends to be a matter of multi-document organization rather than single document enhancement – although we might well see some library intervention in the organization and presentation of documents once they are in electronic form and thus transformable.

The function of informing is illuminatingly different. Although libraries do disseminate some information about what has become available to their user community, the special expertise is the reverse of the publisher's: the

active-searcher passive-information mode: the skilled searching for what the reader needs. I have increasingly come to feel that this distinction between the direction of activity along the knowledge conduit is important to re-envisioning the roles of publishers and librarians in the future.

Measuring value added

Having identified a range of ways value is added by the intermediators between author and reader, we need to think about the process by which that value added is reflected in revenue received by the body adding value. And here we come upon an interesting difference: the publisher as intermediary has primarily expected that his efforts at adding value will be recognized by readers paying for those efforts. On the other hand, the library has generally expected that the community, be it college, city or club, will pay for its efforts because of some perceived general utility of the value that it adds. No one seems to believe that the library's level and range of services should be defined by market criteria -- what it can sell for a sufficient amount to pay its costs. But the contrary presumption is usually made of university presses.

For the moment I will leave that observation to stand but will return to it later. It does though, I hope, raise questions in all your minds as to whether making decisions based purely on market criteria is wise for intellectual and culturally important services and goods. Subsidization of music and theater by both government and private donors certainly suggests a pervasive belief (but sadly not universal) that some things are too central to our culture to be left to the Darwinian struggle of the market place.

Inadequacy of Market Signals

There are in fact good economic arguments for recognizing that market signals will not always be the appropriate ones for determining what is provided. And I want briefly to present three economic reasons why books and even more so electronic documents fall into the category of goods whose provision should not be solely decided by the market.

Cultural concerns

Imagine that a university library charged a serious amount for use of its holdings, and decided what it would add to those holdings based on the revenue generated from various sections. With substantial research grants, the scientists would probably be little deterred by charges for use. Indeed even large access charges would hardly be significant relative to their equipment costs, for example. On the other hand, humanities scholars, usually without research money, would be strongly deterred from library use. The consequence would be a marked decrease in the purchase of new humanities works in the library and a shift of yet more resources to science and technology holdings. I am sure that none of us would welcome that. I hope it raises questions about the use of a market mechanism of this kind to guide library collection development.

But there are more fundamental reasons why the market should not be relied upon to generate best solutions in our areas of concern.

Public Goods

Books and even more electronic documents possess two of the characteristics of what economists call public goods. It is a basic theorem of economics that the market under provides public goods. That is to say, if the market is relied upon to determine the supply of a public good, the amount produced and sold will be less than the amount that maximizes society's welfare. Too few resources will go into producing public goods and too many into producing conventional private goods -- apples, shirts and handguns.

The two characteristics that imbue documents with publicness are non-exhaustibility and non-excludability. With less jargon, non-exhaustibility means that a document is not used up in the process of reading and remains available for another reader; non-excludability means it is hard for the producer to restrict access to the document to those who have bought it. By contrast think of an apple once I have eaten it there is nothing for you. It is exhaustible. And while I have it in my possession, you cannot eat it. It is excludable.

The inexhaustible nature of a document needs little further explanation. We have all borrowed a book and found the text unchanged from that read by earlier readers. Indeed the library exists because of this quality of written materials.

The non-excludability of document is also easy to see. Through easy copying non-purchasers can gain equal access to a document. In a paper world, the existence of photocopying means that some readers obtain a document not from the publisher but by making a copy of the original publication. It is obvious that with copying and sharing so easy in the electronic world this is even more true.

Why does this lead to under-provision? Those who borrow and read an already purchased document or read a copy of a document, gain value from the document but contribute nothing to the publisher to recompense for the costs incurred in creating that value added. The publisher's revenue will thus be less than the total value added by his activities.

Society would be better off if everything is published for which the total value added is greater than the cost of publication. However the publisher can only attend to publish documents for which the revenue will exceed the costs of publication. So the market will only produce the socially optimal result if the publisher's revenue equals the value added. If some part of the value added is not being received by the publisher, the revenue will be less than the total value added. This means that some documents will not be published which should have been and some information intermediaries that were adding genuine net value will close down.

Declining Costs

There is another quite separate argument that market based solutions lead to under provision. This is based on the distinctive cost structure of books, a structure that journals share and so in a more extreme form, do electronic documents. The essential fact is that most publishing costs are incurred in getting to the point where we can make the first copy, or send the first copy over the net. And the costs of making additional copies are small (in electronic publishing, probably very close to zero). Economic theory argues that output of a good should be expanded until the cost of the last copy made is equal to the value added to the marginal person who finds the item just worth buying. If we stop before that point, there are buyers who would gain value added greater than the cost of making that item who do not in fact obtain it.

Society's net benefit is therefore maximized if the price of obtaining the document should equal the incremental cost of producing the document. But that means that sales revenue or user fees, or whatever, are not available to cover the first copy costs. So there is a clear and substantial conflict between the publisher's need to cover costs and the optimum of having price equal to incremental cost. And with the incremental cost in the electronic environment close to zero, the situation is more acute than the example I have just presented.

There is nothing new about this situation. Academic publishers have always had to price well above incremental cost. So buyers who would gain benefit from possession of the book that is greater than society's cost of providing the book have been deterred from purchase. Various mechanisms for recovering some of the first copy costs without loading them onto the individual purchaser have developed: subsidies to university presses, title specific subsidies e.g. from the NEH, subsidies e.g. from Getty to support exceptionally high first copy costs. Also it is common to charge higher prices to libraries than to individuals, either through differential subscriptions or though different editions - paper for the individual, cloth for the library. These arrangements operate to bring the individual purchase price closer to incremental cost. Interestingly the library can be seen contributing to this end in another way: rather than subsidizing the producer to bring price down to marginal cost, society has preferred a mechanism that subsidizes the consumer through funding to the library which then permits free use but not ownership of books.

Cost recovery solutions

Solutions in which optimal pricing and cost recovery are not in harmony are quite common.

There are three types of solutions: socialization, special tariffs, mutualization. I will talk briefly about each as each does raise issues of some significance.

Socialization

It is very common to provide such goods through a government agency. Roads are a good example: huge first user costs, trivial or zero costs per user in non congested situations. They are naturally provided and supported from public funds. So should we just nationalize the provision of academic writings, or set up some organization jointly owned by all universities? I would argue strongly against this because in any re-design of our existing system, we must ensure that there are many diverse and independent channels through which ideas can flow from authors to readers.

It is easy when focusing on economic solutions to lose sight of the crucial importance of our topic: at root we are talking of the exchange of ideas -- and the free exchange of ideas. We cannot afford to invent solutions that do anything to endanger the freedom of individuals to express ideas, conformist and maverick, polite or offensive, radical or traditional. The great strength of our present system is the variety of places to which an author can turn to get his or her work published. This we must preserve.

The university presses have evolved into organizations that do provide this freedom. There are a substantial number, over 100 members of the AAUP, each formulating a distinct editorial policy. Their editorial decisions are made in collaboration between press editors and a faculty committee: university administrators rarely have any say in what is published. In my experience faculty boards are very aware of their responsibility to provide a channel for a wide variety of ideas and defend that freedom zealously.

In addition, university presses have been energetic in supporting emergent fields. The fact that sales do matter in their operations means a sensitivity to new trends and developments in the academy. And the number and variety of presses is a good insurance that routes to publication will be available for those fields and those scholars struggling to put forward new perspectives.

Thus in this consideration of institutional designs, I want to resist monolithic solutions to the cost recovery problem. But more: the provision of diverse routes to publication must be a very central criterion in evaluating any proposed changes.

Special tariffs

The second type of solution to the cost recovery problem is special pricing structures. There is an enormous literature and a very technical one on designing pricing schemes for industries with cost characteristics like those of publishing. Much of this literature is driven by the problems of pricing for electric utilities that are faced with very much the same problem as we are.

This problem can be expressed: we need to recover high initial costs while setting a price close to incremental cost so that no one whose benefit from the product is greater than the incremental cost will be deterred from buying.

One common structure for this kind of problem is what has recently been described to me as country club pricing. You pay a membership fee but then pay incremental costs for all the things you do within the country club. There are many other similar applications of this kind of system. Gregory Rawlings proposal is of this kind. We might envision a journal charging a subscription fee which buys you the right not to receive a traditional journal but to have copies of articles you want sent to you at whatever the incremental cost of sending might be.

However all applications have one thing in common. The customer is a repeat customer who is prepared to pay for something akin to membership. This may well make sense for a journal. It is not very plausible for the individual book publisher as an individual may only infrequently want a book from a particular publisher. Some kind of sales consortium might be a solution here.

I am though dubious that scholars in the humanities and social sciences without research money will be very prepared to pay

the quite high annual fee which this system would require. So while I believe it is an avenue for further exploration, I am not confident that this is the way to a full solution.

There is one related point that I do want to make. Some of the suggested solutions to the problems of academic publishing have eliminated the price mechanism altogether and suggested that academic publishing should be fully subsidized. I believe it healthy that the producer have to be to reliant to some degree on revenue from users. We need responsiveness of two kinds: one is selecting for publication those things that scholars actually want rather than perhaps those things that authors believe should be published; and the second is taking into account users' views about what does and does not add value. I think an entirely subvened system would rapidly drift away from user needs. We have the ex-Soviet Union as something of a model for what happens when producers do not have to respond to customers.

However there is a narrow line between responsiveness to demand and decisions being dominated by pursuit of products that have the highest demand. Subvention as a significant part of total revenue can help resist that pressure, which is a pressure for the demise of scholarly works.

What kind of entity should this be subsidized? It should be a nonprofit with a very clear mission to serve the academic community rather than to pursue primarily economic objectives. If it is based at a university, it should not be the exclusive publishing route for that university's faculty. They must have a wide variety of publishing options open to them. It must be able to maintain standards by selecting from amongst local faculty work and as part of diverse and catholic system of scholarly publishing must be open to accepting work for scholars at other universities.

Mutualization

This is actually what we have already and so rather than envisioning a new basic framework under this heading, I want to advocate rather the full exploration of the potential of present arrangements – a potential that has been sadly neglected. But this is to jump ahead. First I should return to the basic problem: one entity is worried about cost recovery, while another entity is worried about the impact of increasing prices on its budget. In most cases of this general kind, the two entities are distinct and distant: we therefore need a solution that works through a market-type mechanism to a solution that ensures, at least viability for each entity and moves us to a position that minimizes social costs and maximizes social benefits. Amazingly one can in many instances devise solutions that approximate to those objectives.

However, in the particular situation that we are considering and in which we are involved, we can cut through many of those complications: the main participants are already under common ownership. University presses and libraries and the faculty they both serve are all part of the same institution – the university. Yet a model has become established in which presses relate very much at arms length with libraries. The prevailing mind set is a customer-supplier one. In other words we have mutual ownership but seek none of the benefits that mutual ownership should give us.

Now before I move onto ideas for redesigning our institutions, let me make a caution. Institutions tend to evolve for good reason and we should not casually meddle with them. Presses have evolved away from close identity with their home institution because they saw it essential, if they were to have the power to be selective and thus able to apply high standards, that they not be the tied outlet for all the work of local faculty. The press that is the local publisher ends up taking what faculty write and actually ends up not publishing the best of what faculty writes. As August Fruge put it so neatly: "In order to succeed at home, a press has to succeed abroad."[2] So in pursuing mutualization, we have to recognize the need for the press to have wider horizons than just its local institutions. Our challenge is to design a system that gains the benefits of mutuality without forcing the presses back to an exclusively local focus.

I am not going to provide a full solution here. It is something that needs more thought and

discussion, indeed mutual discussion, to define suitable arrangements but the essential first step is that libraries and presses on individual campuses begin to think about their problems in a system-wide way. Individual pursuit of solutions to problems perceived in the narrow can combine to perverse solutions. Those of you who read The Fifth Discipline by Peter Senge will recognize a point that he makes and makes most persuasively: one must think of the whole system and not separate units of the system.

Conclusion

I have concentrated on questions of value added and revenue and institutional arrangements. These are important issues, but others must dominate. As we build a new world of electronic publishing we must never lose sight of the major issues which are not economic or technical but are about the freedom of ideas and the sustenance and transmission of our culture.

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[1]Rawlins, Gregory J.E. *The New Publishing: Technology's Impact on the Publishing Industry Over the Next Decade.* (Dept of Computer Science, Indiana University, 1991) unpublished research.

[2]Fruge, August. "The Ambiguous University Press." *Scholarly Publishing* 8, no.1, October 1976: 4.

Fighting Infotainment: The Nonprofit Sector's Responsibility in an Online World

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The 30-second version of my talk is as follows. Intellectual property security and authentication methods exist. They are all imperfect in some fashion. Any scheme we choose must be considered in terms of the implicit meaning such protection methods communicate. Heavy-duty protection may be essentially unnecessary, provided we shift some assumptions we have about our roles. Reasonable, non-intrusive protection is all we need. By making these shifts in our assumptions, we'll benefit humanity. We have a responsibility to do just that. Now, those of you who want to can leave to take a break.

The title listed in the program is "Security, Authoritative Versions, Privacy," a title imprecise enough to give me a lot of leeway, leeway I intend to take. The array of concerns slowing down publishers are as interconnected as a hypertext web, and I want to address them in the best way I know how.

The networked environment's strength is the interconnectivity between people, ideas, and resources. It encourages curiosity and communication and holds the potential to create the ultimate educational environment, a resource limited only by users' creativity and curiosity. The unidirectional character of broadcast media, on the other hand, encourages passivity, receptivity, and inaction. The mass media of radio, television, newspapers, magazines are primarily enticements to bring receptive consumers to the advertisers.

There are signs that the online world could be molded in the image of the mass media as just another means of broadcasting have been. On the other hand, it may be that the intrinsic structure of interconnectedness is so fundamentally different from broadcast that such a development would prove impossible. I hope so. But when I see where the big money is going now that the major commercial corporations have cast their acquisitive gaze on networked interactivity such as entertainment, role-playing games, online shopping, infotainment, I worry. The huge consortia are building systems not to enrich people's minds, but to enrich themselves by connecting to consumers. They do not aim to reach citizens, nor students, not even users, but *consumers*.

I have four children. What I want for them is what I use as my touchstone in developing structures for the University of Nebraska Press's eventual online publishing endeavor. I do not want my children to spend their time in a hyper-Nintendo environment. I do not want a medium that distracts them, that teaches them how to be better passive recipients or how to become better consumers. Instead, I want an environment that encourages active investigation, directs learning in an engaged pursuit of education, makes better students and better citizens.

The network, with the rich variety of material that is currently "owned" by the non-profit sectors, could create such an environment, and in so doing it could promote a nation of knowledge-seekers who actively graze to learn more about whatever piques their curiosity. I am to talk about security, authentication, authoritative versions, and the fears surrounding intellectual property, and oddly enough, I am. Possibly, many of you were expecting, even hoping, that I would put your minds at rest and say that there's an answer to that biggest problem for publishers on the net, securing our property. It is not quite that easy. There is a variety of solutions, some in process, some available now. Many of the systems will be put in place by the non-profit sector. But they are nearly all flawed.

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Let me emphasize that copyright matters. Intellectual property matters. And we must, absolutely must, be able to sell intellectual content on the network if we want high-quality, interconnected, deeply enriched intellectual content to be available to everyone. However, the nature of our own special societal role provides the non-profit community with a mandate to re-conceptualize an approach to intellectual property, at least when it comes to its dissemination. The question of property protection as it is currently being addressed – the notion of protecting every bit of it and possibly being able to generate revenue from every word of it – is founded on an old premise made invalid by technology.

High-intensity security may be a moot point. To clarify, let me outline a few of the security systems that are currently being developed to provide a sense of them. On-the-fly public-key encryption/decryption, for example, is being tinkered with. The sending machine encrypts data in a specific manner so that only the appropriately enabled recipient can decrypt it and read it. That minimizes some of the dangers of information "leaks," but once in a user's machine or screen, the document is unencrypted and no longer secure. There are also client-server structures that gauge use, count "printings," and limit access according to what the client (the user's machine) has been told. Another sort of control, header-based security, embodies identifiers and encryption in the first string of characters, reasonably untouchable, which identify the data as being intellectual property.

Among my personal favorites, still in the development phase, is an "Internet billing server," a central Internet site logged onto by the user. It keeps track of what for-pay network resources have been paid for and what for-free resources are available, and it allows access to them by the user. Rental structures, outright ownership, subscription systems, and the like are all recorded on the billing server, payments are made to the billing server, and access is made through the billing server. The operator of the server retains some small sum of all transactions in exchange for performing the protection tasks and the financial transaction tasks. Thus a user could "own" information on twenty separate sites, subscribe to databases at twenty others, and rent time on a few others on occasion, and only have to hook up to a single system to access them all. In theory, the server could handle the decryption, encryption, password and other security systems, allowing a simple one-stop service for the user.

A great deal of energy and investment is being made in addressing these questions because so many businesses are dependent on information ownership. The Clipper Chip, for example, is an encryption/decryption standard with Presidential approval. It has a built-in back door for the National Security Agency and the FBI. The ethical and political concerns do not matter. The chip's existence is merely another signal that security systems are coming about.

The commercial sector will resolve some of these problems for some of their products and even for some of our academic products. Most of the work that I am familiar with attempts to design complete-protection schemes, which, while useful for banking, video-on-demand rental, or digital music sales, are not necessarily the optimal scheme for the non-profit sector. So far, there are drawbacks and holes in every approach for securing digital content units, whether movies, pictures, books, or sound recordings. Intellectual property can be utterly secure, if one is willing to use security structures that are expensive (such as the Clipper Chip, special software, and special hardware), limiting (only those with the right client, right software, and right equipment), or difficult (multiple keys, multiple decryption systems, etc.). The larger the hassle or the larger the expense, the better the protection. But I ask you: do we want to make it a big hassle for our customers to reach us and our information? Do we really want to suggest that educational information is a commodity to be consumed and jealously protected by its owners?

Nonprofit publishers, nonprofit organizations, libraries, schools, and the like are fundamentally different from commercial publishers and vendors. As we develop our approach, we must address that difference into the choices we make about authentication, intellectual property security, and publishing in general. I am far from sure that I want to encourage the view that all knowledge be property, that permissions must be acquired or

and large sums of money paid before readers may enter the hallowed but havens of the libraries, universities, and schools.

Imagine that someone invents a magic box that costs fifty dollars. It allows the user to drop in a book and in five minutes to obtain an digital copy of that book. Perhaps it uses a combination of lasers, x-rays, and microwaves to interpret the refraction at different depths to read each page individually, front and back. The technology doesn't matter, since this is merely used as an example. It's the ultimate Xerox machine.

What would publishers' reaction be? To try to encrypt our texts? To print all our books in red ink or deep-brown paper to fool the boxes? To try to enact laws to preclude the manufacture of the box? To force libraries to search patrons? To require the manufacturers of the box to have a microwave transmitter that sends a fingerprint, Visa number, and other records to the ISBN holder of any book copied?

These are analogs to the approaches being used in digital security schemes, and I do not believe university presses would be willing to do very many of these. I hope we would instead try to rethink the process of publishing, rethink the context of our products and services, and remodel our acquisition and transmission processes, so that we could continue to serve our readers, while we continue to survive.

One of the fundamental flaws in the design of most of the digital security systems is that they are based on an old structure: the unit. A book is a unit. A CD-ROM is a unit. Publishing's entire structural underpinning is based on the sale of units. As publishers, we assume that a book is intact, isolated, and transportable, to be sold once to a reader, or to a library to loan to readers. We gamble on the number of copies to print, knowing that the more we print, the cheaper the unit costs and the cheaper the final product.

Though we are nonprofit publishers, we do think as businesses. Few of us completely like this reality, because not many of us are in it primarily for the money. If we were, we'd all be working in copyright law right now. In order to do our jobs and survive, however, we do think in business terms, and our business has been units. Units, however, are not the strength of a networked environment. Of course I can send a picture over the Web, but so what? I can get *Moby Dick* from the Gutenberg Project, too. Or the "I Have a Dream" speech from any number of sources.

The model that most electronic publishing plans, security schemes, and authentication systems are operating under is a replication of the unit-based model, in spite of the nature of the new medium. The model we are quickly approaching, however, is one of interconnected resources, one where context is the value being published. Some of the things possible only in a networked environment, such as cross-textual searches, hyperlinks between documents, and pathway authoring, run counter to the unitary framework. Context is as much a value as content is. *Moby Dick* is more interesting and valuable if critical apparatus is available from people who have deeply studied the novel. "I Have a Dream" is more interesting and valuable if contextualizing historical material (photographs, news blips, analysis, and sound) is also available, especially for the young.

Intellectual property is less valuable in isolation. To some extent, hypertextual resources, collections of related documents, are their own security. A page is less valuable than a chapter, a chapter less valuable than a book, a book less valuable than a book with notes and pictures, a complete book less valuable than a book in its intellectual, hypertextually linked context. Instead of securing the unit, it might be possible to use context as its security, making it more likely that users will be directed to a resource if it is affordable. It is in the reader's interest to have access to the document *and* all the links and context. Integrated resources and interwoven collections of units are their own best protection. Inexpensive access to those resources seals the matter. "Nobody is going to steal a swimming pool, and why steal a gallon of chlorinated water?" The value is in the resource, with its diving board, its showers, its lockers, its lifeguard.

I was recently invited to participate in a two-day meeting to help the Institute of Electrical

and Electronics Engineers (IEEE) develop an electronic publishing strategy. The IEEE is a $92 million organization, of which $65 million the publications budget. The IEEE produces, distributes, or coordinates about 40% of the primary journals in the fields they represent. How they make the best use of the opportunities of the online information environment is a big question for them. How do they keep from jeopardizing the $65 million system? Many of the presentations at the meeting challenged the old ways of doing things. Clifford Lynch, from the University of California, phrased the issues succinctly. "What is our role? Is it to make money, or to serve our constituents? It's not that simple, of course. We must earn revenue to serve our constituents. But he addressed that by stating that the question shouldn't be "How can we make money to survive?" but "How can we serve our constituents and survive?"

During my talk, I described a possibility that is relatively unique to the IEEE. Because the organization is scientific and technical in nature, their information (journals, proceedings, texts) is time-sensitive. The highest value resides in the text during the first year or so of publication. After that, it becomes more or less archival and possibly referenced more than read. By acknowledging this time-sensitive characteristic of IEEE publications, the organization can put differential pricing structures into place. Two-year old publications could be provided as an online resource allowing broad-based, full-text searching, interconnections, and what I call "pathway authoring," meaning that teachers, scholars, and scientists could author pathways through selected texts. Topics such as applications of electromagnetism, comparisons of experimental method, and interdisciplinary overviews could be available, all with a variety of age-appropriate explanations.

That is the sort of resource I want my children to have access to. My son plans to open Thor Jensen's Hardware Store and Invention Lab, when he grows up. Instead of asking for a story at bedtime, he asks questions about the way things work. I want this child to have access to many information resources and would be thrilled to pay for a Junior IEEE membership so that he could follow his nose and follow other people's noses. Such access would dramatically improve the chances that he could become a remarkable engineer, or scientist when he grows up.

In an airport recently, I overheard someone say, "The question now is not getting content, but figuring out all the ways the same content can be repackaged." The IEEE, in the above model, would be repackaging older, less "valuable" information — that is, less valuable for their primary market — in a way that can make it very important to a new audience. The need for heavy-duty protection isn't as prominent there because there would be very little value in any individual paper, essay, speech, or research report. The value is in being able to do cross- and inter-textual searches, follow hyperlinks and pathways, and display related but not textually included graphics. A simple login name and password would be enough protection for this sort of resource. Whole-scale theft isn't a worry, since to resell this information one would have to advertise, and a thief doesn't advertise his theft.

Finally, this approach provides authoritative versions of all these documents, which is the ultimate security. By providing a resource to which dependable reference can be made, the IEEE decreases the likelihood of corrupt versions floating about the net, as long as the access cost is reasonable.

Toward the end of the meeting, an engineer stood up and said, "I was doing some back of the envelope figuring here. We have over 300,000 members in the IEEE. We have a publishing budget of sixty some million dollars. We sell journals to libraries, to non-members. With those kinds of numbers, we could provide quarterly CD-ROMs of every single publication we generate to our members for well under $200 a year. That would certainly be a service to our readers." Certainly such a capability would be a service to their readers. Indeed, it would be a service to the nation, if not the world, in making accessible a vast array of high-quality information available at a low cost. And it would allow the IEEE to continue doing what they do while providing continued financial support."

Which brings us back to the question of what it is we are doing -- what our role is, and what that implies about how we should be rethinking the way we address ownership, intellectual property, security, and authorization. If we are a business first, and each unit is to be protected from any possibility of illicit copying, then we will continue to try to do the equivalent of printing in red ink to foil that ultimate Xerox. If our job is to maximize profit at every step of the way, we are commercializing knowledge in tremendously unpleasant ways, which will be very costly in the long term to the development of our society.

If, however, we acknowledge our work as a service, then our job is to provide the best information in the most integrated fashion possible to the most people at the lowest possible cost. From a service perspective, it is not part of our charter to make it really difficult to get at our information; high-tech and high-cost and high-hassle intellectual property protection is antithetical to our mission.

There is a battle going on that is very important. The battle is for control of the uses of the network. It is between encouraging passivity and intellectual sloth, and encouraging creativity and intellectual aerobics. It is between the broadcast mode of the mass media and the interactive mode used by the best teachers. I hold that we are educators first and foremost. If we allow the Barry Dillers of the world to define the structure of the battle, we will lose. If we try to publish and protect our data in the old way, in the unitary framework, then we will end up losing to the Sega/Nintendo/online shopping networks. Some of us will continue to profit, but the opportunity to create a culture of lifelong learners will have been lost.

Nonprofit publishers, in coalition with libraries, universities, and schools, have a responsibility to work together to develop dissemination, cost-recovery, and authentication systems that are combined with reasonable security systems. We must maintain the individual qualities, such as high-quality selection, editing, text-specific design, marketing, and cost-recovery mechanisms that publishers provide while also allowing rich full-text access to non-enriched data. By developing coordinated SGML and hypertextually encoded resource bases, by developing subscription and site-license structures, and by developing hypertextual authoring systems within that environment, we can create a high-quality arena where knowledge acquisition is fun.

No single nonprofit publisher's list, regardless of size, will be enough. I need my texts to be able to quickly, easily, and inexpensively hook into the University of California's, Oxford's, Utah's, and New Mexico's material. And the Library of Congress, the Oregon State Historical Society, and the archives at the University of Mississippi. What I am recommending is that the nonprofit sector begin serious discussions of fee structures, licensing models, and resource-access pricing models -- Not price controls, but models of for-fee interconnectivity within and between our resources. By working as a directed consortia we can create a bastion of quality -- peer-reviewed, intellectually rich quality information that will be used by educators, schoolchildren, university students, scholars, and parents. We can craft cost-recovery systems, through a combination of multiple "repackagings" for different audiences, repackagings that benefit libraries, publishers, universities, scholarly communities, K-12 schools, the average reader, and the information-seekers of the world.

Many people are working on developing such a system, the University of Nebraska included, but we are all working somewhat piecemeal. Without a more concerted, consortial effort, we will look shabby compared to the profiteers. We do not need to concern ourselves about bandwidth. It will be there. Connectivity will be there. Access will be there. In fact, most of those things are here now, for a good part of our audience. High-resolution, low-power, low-cost flat screen displays will be there. Reasonable security, as I hope I have shown, is solvable structurally. Authorization is intrinsic to "official site" models. The real roadblock right now is structural: we don't have models for licensing and pricing resources in opposition to units, or models for pricing and licensing interconnections between resources.

We must consciously develop new models as quickly as we can.

University presses, society publishers, libraries, museums, societies, and other educational organizations must communicate their mutual needs and desires. Such nonprofit institutions have to rethink their real role in publishing and to find mechanisms for cooperation. These ARL/AAUP meetings have been instrumental in making the connections between publishers and libraries more explicit. I want to see much, much more.

We have a responsibility to counter the commercialization of networked interconnectivity and to counter the trend toward passive participation in education. By focusing on our primary goal of service to our community, we can restructure ourselves, and become a powerful, influential force in the lives of everyone.

Will it Scale up? Thoughts About Intellectual Access in the Electronic Networks

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I am convinced, Yorick, continued my father, half-reading and half-discoursing, *that there is a northwest passage to the intellectual world; and that the soul of man has shorter ways to go to work in furnishing itself with knowledge and instruction, than we generally take with it.*

Lawrence Sterne, Tristram Shandy

I would like to examine briefly the prospects for intellectual access on large electronic networks. In particular, I am interested in how a searcher might find information that has a particular intellectual content or subject. I will not be considering searches for information by specific authors or with precise titles. I consider searches like this to be comparatively straightforward. Here I am concerned with the much more problematic searches for information that have a fairly specific intellectual content but no precise authorship. Let me begin with a brief anecdote that may make this clearer.

Although I grew up on the East Coast, I went West for college, and like many before me I acquired an Easterner's fascination and love for the frontier. In particular, I became interested in those hardy individuals who preceded me, when Route 66 was just a series of Indian trails. Histories of the Westward expansion were interesting, but they were always told with the historian's viewpoint and lacked the immediacy that was apparent in a first hand narrative. Of course I read Lewis and Clark's journals, but I also wanted to read about the journeys of less heroic proportions — of those virtually anonymous individuals who went West in the early years of our country not because Thomas Jefferson asked them to, but because they, for lack of a better phrase, just wanted to try something new. Perhaps you can understand my enthusiasm when, by chance, I came across Osborne Russell's *Journal of a Trapper (1834-1843)* published by the University of Nebraska Press. It was an articulate, first-hand account of a fur trapper who spent much of his time in and around Yellowstone and Jackson's Hole, Wyoming, an area that I knew well.

During the late 1960's and early 1970's, I chanced on other frontier narratives: Powell's *Exploration of the Colorado River and its Canyons* [Dover Books], Langford's *Big Horn* [University of Nebraska Press], and *Tabeau's Narrative of Loisel's Expedition to the Upper Missouri* [edited by Annie Abel, University of Oklahoma Press], to name a few. But my selection of books was not systematic, it relied on the pure chance of my browsing the gift shops of National Parks and the American history sections of random bookstores. My impression was that such first-hand narratives were rare items, so I treasured the few I had, and did not expect to ever find many more. A few years ago, though, as I was moving some of my books, the dust jacket to *Tabeau's Narrative* came off and I found on the inside of that dust jacket, to my great surprise, a list of almost a hundred first-hand frontier narratives published by the University of Oklahoma Press. Here was the treasure trove of publications that I had dreamed of years before. Sadly, by this time, the urgencies of adult life had squeezed out most of the time I had for such recreational reading. I had been overtaken by what Zorba the Greek had called the "full catastrophe" of adult responsibilities. I only wish I had chanced to read the back of that dust jacket earlier.

The point of this anecdote is that such experiences, I think, are not uncommon, and it is not just a personal disappointment, but a commercial opportunity that was missed. I was an enthusiastic reader who would have gladly purchased and recommended many first-hand narratives of our Westward expansion — the University of Oklahoma Press had published many of the kinds of books I wanted. Yet neither of us knew the other existed. True, I had one or two of their books, but I did not know then that university presses often concentrated on certain types of books, so I did not pursue my interest with them, and certainly even if I had found out about Oklahoma's publications, there were likely to be other similar publications by other similarly unobtrusive publishers. I had almost no chance of tracking them down. I was like a hapless pioneer who wanted to go West, but didn't know where the Oregon Trail started. Bookstore assistants are often helpful and friendly, but their knowledge of the publishing world rarely goes beyond the best-seller lists and comprises information that is available to most of us, anyway.

Realistically, university presses and other not-for-profit publishers cannot expect to have the kind of publicity that major publication houses have. But I am convinced that, like me, there are many enthusiastic customers for the specialty books that these small presses offer. In light of this, the rapid expansion of the loose "ad-hocracy" of networks that we call the Internet offers an enormous opportunity for both small publishers to become more widely visible without incurring dramatic marketing costs and for the enthusiastic readers to "cruise" these networks in search of what Lawrence Sterne, in his great 18th-century novel *Tristram Shandy*, called the "northwest passage to the intellectual world." For Sterne, the "northwest passage to the intellectual world" was through the "auxiliary verbs" — for us, it may be through the Internet.

But it's easy to be enthusiastic at the beginning of any grand endeavor. The pioneering users of the Internet have returned with wonderful tales of access to vast intellectual riches. And this intellectual universe expands before us in much the same way that the frontier must have to the young Osborne Russell growing up in a small 19th-century town in Maine. But can we map the topography of the intellectual resources on the Internet as easily as, say, the topography of the Pacific Northwest? Or, perhaps more pointedly, can someone who frequently loses his car keys be able to find his way to the information that he wants on a large electronic network? In order to understand this problem we need to make some basic distinctions. First of all, we need to have some understanding of the size of these publicly available networks, and by *size*, what I mean is how difficult it is to find what you want on them. The problem of *size*, then, is really a problem of *access*. But even here we must make another distinction — between *physical access* and *intellectual access*. Physical access is concerned with how you can get your hands on some information *whose address you already know*. Intellectual access is concerned with finding the address of some information that has a desired intellectual content. In terms of a library, finding where on the shelves the book with call number QA76.A1A84 is, is a problem of *physical access*; finding out whether the book with that call number is the one that you want is a problem of *intellectual access*.

Clearly, the problem of intellectual access must be solved before the problem of physical access. But this is not the way the access problem of electronic networks is presented. In short, the dramatic physical access speeds of electronic networks seduce us into believing that our speeds of intellectual access will be commensurately fast. Such is not the case. But it's hard to understand the magnitude of the intellectual access problem. Perhaps an analogy will help. Suppose that we wanted to find a book that is one of several hundred accessible to us. This is rather like finding a particular individual in a crowded room of modest size — this room, for example. Not a particularly difficult problem, even if our description of the book or person we are looking for is fairly general. But suppose we wanted to find a book in a small library of 50,000 books. Although we have all been to libraries of this size, it may still be difficult to imagine the magnitude of the task. Consider a similar problem: Many professional baseball parks in the United States hold around 50,000 spectators, so we might be able to better visualize our search task if we imagine our goal is to find a single individual attending a sold-out game at, say, Fenway Park or Tiger Stadium.

But now our task is more formidable. Suppose also that our guidelines for finding the person we want are fairly general: that he is middle-aged, has dark hair, dark eyes, is 5'10" and slim. Our search is more difficult still. Now suppose we are searching for a book in a moderately large library of a few 100,000 books. Here, the analogy would be to finding someone at a Rolling Stones concert in New York's Central Park. But even now, I don't think that we have yet to comprehend the magnitude of the intellectual search space on the Internet. Searching through the millions of intellectual resources that are currently available through the Internet, utilizing only the search tools also currently available, is analogous to searching through New York City for a specific person with only the general description that he has dark hair, dark eyes, is middle-aged and slim. Even if we could see a different individual every second — that is, our physical access to these individuals was optimal — our search would likely end in failure. Why? For two reasons. First, there are too many other people in New York City who have the same general description as the person we are looking for, and, second, as a searcher, there is a limit to our searching persistence: we can't, or won't, search forever. This is called the searcher's "futility point."

On large text retrieval systems, good physical access methods do not necessarily improve our overall search prospects. Faster computers and faster networks just get us more quickly to the wrong places — and on a network the size of the Internet, there are too many "wrong" places to go. Our patience with the search will run out long before we have exhausted the places to look.

If we look closely at the problem of intellectual access, we can see that the success of any search is critically dependent on how the desired information is represented or described. These representations are abstractions of the intellectual content of information. They may consist of titles, abstracts, keywords or other similar devices, and they may be applied either automatically or through some manual indexing process. Regardless of the methodology for creating such representations, they remain the key link in the process of intellectual access — no search can be better than the representations on which it depends. What can we say about these representations? To be effective, these representations must satisfy three criteria:

> 1. They must accurately *describe* the intellectual content of the information they represent.
>
> 2. They must clearly *distinguish* the content of the information they represent from the content of similar, but different, accessible information.
>
> 3. They must uniquely describe and *retrieve* a small enough number of information items that the searcher can examine them without reaching her futility point and giving up.

Traditional subject descriptions usually satisfy one, but on large text retrieval systems they do not typically satisfy two or three. This is what we call the "scaling problem" in Information Retrieval. Using subject descriptions to find specific information in a large collection is like trying to find a specific individual in New York City, using only general physical descriptions. Anyone who has tried to find fairly precisely defined books through the subject catalogue at the Library of Congress has an understanding of the true magnitude of this problem. One of the ironies of the publishing industry, though, is that the need for reliable, specific access to texts with precisely definable intellectual content is greater for the smaller publishers than it is for larger, mass-market publishers. Smaller publishers such as university presses, have a fairly narrowly defined segment of the book market, and must be accessible by customers with fairly precise interests. If these precisely definable publishers and customers cannot find each other, then we have a situation like the one I described at the beginning of this paper. No small publisher has enough economic slack to endure too many such missed opportunities.

What should we do? If the representation of texts is the key to how accessible those texts are in a large retrieval system or network, and if we have already said that traditional subject descriptions are inadequate to this task, then what are we to do? Let's go back to Fenway Park. We stated that under normal

circumstances, it was futile to look for someone in a sold-out baseball stadium with such general descriptions as the color of his hair and eyes, his height and his weight. But if we also know that the individual we want always sits along the first base line, takes his 8 year-old twins with him, has a handlebar mustache, and wears a bright yellow jacket, then we have a much better chance of finding him. What we have done is to partition the search space---we have reduced a large search space to a smaller one. This is the key to intellectual access on large text retrieval systems. So now we can say that there are essentially two kinds of representations: those that describe the intellectual content of specific texts, and those that describe the partitions in the search space. The representations that describe the intellectual content of specific texts are already familiar to us; they are the titles, keywords, and subject descriptions that are commonly used to represent textual information. They are frequently imprecise, but are only a problem when used to represent information in fairly large document or book collections. On small systems they work reasonably well.

Representations which partition the search space differ from the previous kind of representation in that they must describe information more precisely. Back to our baseball analogy: the representations that describe the intellectual contents of specific texts are like the general physical characteristics that describe the person we are looking for. The representations that describe the partitions in our search space are those like the fact that our baseball fan sits along the first base line. Such a description narrows our search space considerably and allows us to concentrate in a specific part of the stadium -- greatly increasing our chances of success. Descriptions such as "dark hair", "yellow jacket", or "brings his 8 year-old twins" don't help us nearly as much since we would still be committed to searching the entire ball park for individuals with these characteristics. Representations that partition a search space must be able to delineate a fairly precisely definable "region" in the search space---a region which almost certainly contains what you're after, whether a person or a book. If the information that you want is not in that definable region, then the partition can do more harm than good. In our baseball example, if we are lead to believe that our friend sits along the first base line, but in fact, he prefers the bleachers, then we are likely to expend all of our search effort in a completely unproductive area.

So what's the "bottom line" in all of this? Can we really plot a route to the Northwest Passage of the intellect? I'm not sure, but we can certainly do better than we are doing today, and if we are to provide effective intellectual access across the large electronic networks we are now building, we will have to do better in a hurry. Most published book descriptions rely on the vague and overworked category of subject descriptions---representations that are not precise enough to accurately distinguish even a modest number of books, much less the total production of all the small presses that might have access to the Internet. It is possible that we might be able to make subject descriptions better than they are now, but it is unlikely that they will get *much* better than they are now; and even marginal improvements will require substantial expenditures of effort. Subject descriptions were simply never meant to make fine intellectual distinctions among the texts in large collections. This is a fact of language. Does this mean that subject descriptions are useless? No. But they are only useful in making distinctions between small numbers of items. They need to be supplemented by better ways than we have now for partitioning large collections into smaller collections. For example, searching for a book on "computers" doesn't help much if we are looking across the listings of a large number of publishers. But if we know that what we want is very likely to be published by one or two small publishers, then, within *that* partition, the generally vague term "computers" may be useful. Here we can see one way in which publishers might be able to provide better access to their publications: if at all possible, they should describe the kind of material that they publish, and these descriptions, like the abstracts of journal articles, should be searchable as a separate category on a large network. Here the searcher looks first for a publisher who is intellectually compatible with his search criteria, *then* he tries to describe the intellectual content of the specific publications he wants.

But there are other ways of partitioning the intellectual universe of publications: some are obvious, some are less so, and some remain to be

discovered. For example: types or forms of publication may be a useful way of partitioning a large collection of publications---diaries, letters, essays, collections, festschrifts, oral histories, to name a few. All of these could be searchable categories. Time and geographic partitions could be useful too, for both fiction and non-fiction works. Time and geography might also have more than one dimension: they could refer to the time or region in which the work was produced, or the time or place that the work is concerned with. In some cases, both dimensions might be useful. In other cases, expanding the context of publications might make useful partitions: for example, by making the institutional affiliations of authors a searchable field inquirers could get access to publications written by authors connected to institutions which deal with issues they are interested in. In some instances, publications may be part of a related series of publications. It might be useful to make the name and some description of the series accessible by searchers also.

These are just some examples of the kinds of partitions that could be made in the intellectual search space that publishers may find themselves in (and I'm sure that publishers can come up with much better candidates for partitions than I can). If we see the representation of the intellectual content of publications as a problem of simply describing their content, then it's hard to see the need for such partitions. But if we see the problem of intellectual access, as I do, as critically dependent on the number of items accessible, then we must not only describe the accessible texts faithfully, we must represent them in a way that makes them distinguishable from many other texts that have similar representations. This is the purpose of the partitions.

There is one more issue of intellectual access that I would like to mention---the issue of "closeness". Currently, we don't have a good sense of how close our near misses are. On small retrieval systems, this is not so much of an issue, but as the retrieval spaces get larger and larger as they have become on electronic networks, it is not enough to know whether our searches have failed, we need to have some sense of how far off the mark we have been. If not, then searching these large intellectual spaces becomes like pitching horseshoes in the dark---we can hear the "ringers", but if we miss, we have no idea how to correct our aim. It is possible that the partitions that I have discussed will give us a sense of how close our misses are, but clearly building this kind of feedback into our search mechanisms will be a challenge of major proportions.

Improving intellectual access will not be easy. But it will be necessary, I think, if we are to have adequate intellectual access to information on large networks. The Northwest Passage to the intellect may be, like the real Northwest Passage, just a vision, but, like the efforts of the pioneers who preceded us, our quest for it will, I think, improve our ability to get where we want to go.

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Copyright

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As members of the research community, we face a number of serious problems. One of them is copyright -- how we understand it, how we use it, and how it is to work in a networked environment -- and another is the economics of scholarly communication -- who is really paying for what, how we do more with less, and how it is all going to work in a networked environment. Copyright issues and economic issues are closely related and I'll have a little to say about that relationship, but since Colin Day has already spoken about economics in some depth, I'm going to be talking mostly about copyright. At the outset, though, I'd like to state both a fundamental premise of my own and a conclusion I hope to bring you to, if you don't already hold it. Simply put, these are issues that affect all of us. If we are to solve them, our best hope is to solve them by working together.

That is just by way of saying how pleased I am to be here. I have been in publishing for twenty-four years, scholarly publishing for the last fourteen. and this is only the third conference I've gone to at which librarians and scholars and editors and publishers have come together to talk to each other. The other two were the last two meetings of this group. If we find that we disagree with each other about some things, that's only to be expected; we each spend our professional lives working on a different part of the puzzle.

But it is one puzzle, and copyright -- where author's rights, publisher's licenses and user's needs intersect and sometimes conflict -- is one of the key pieces. Many of the conflicts can be resolved. Some cannot be, in the sense that no attempt to balance different sets of interests can completely satisfy all of them. But if we accomplish nothing more today than a clearer understanding of where we don't agree, I still think that's an important step in equipping all of us to deal more intelligently with a future that seems increasingly to consist of nothing (with a tip of the hat to Marge Piercy) but enormous changes at the last minute.

The purpose of copyright can be difficult to understand in a university setting, because the very idea of copyright seems to run counter to the high ideals of university life. Universities today -- especially the large, publicly-supported universities that most of us work in -- are complex institutions with many goals that do not always coexist easily, but at their core, they're still dedicated to the search for truth. Or, if you prefer, to a search for underlying principles, verifiable theories, and accurate explanations, however qualified the search may be by the contingencies of academic fashion, government financing, and political weather. We don't capitalize Truth anymore, except in our dreams. We speak of truths instead, but our dedication to a life searching for those truths connects us to each other and to that long line of gowned scholars stretching back to the great medieval universities of Salerno and Bologna and Paris, and finally to Plato's Academy.

In this world, communicating the results of research is essential. It moves disciplines forward and establishes professional reputations, and in evaluating the record of that research, whether it is a manuscript being considered for publication or a published book being reviewed for a professional journal, first consideration goes to the significance of the facts and ideas it brings together. The form in which those facts and ideas are expressed is of distinctly secondary importance. as long as they are put in reasonably intelligible English, and as long as the conventions for scholarly writing in that particular discipline are observed.

That point is a simple one, but I think it explains something important about formal

academic discourse, and about the way many of us who read and write it tend to think about copyright. This focus on the primacy of facts and ideas, a focus that has informed academic thinking and research from its earliest beginnings and that all of us accept and value as a noble intellectual tradition, can make it difficult to take copyright seriously. Copyright protects forms of expression, not ideas or facts, and we tend to see specific forms of expression and stylistic choices as more or less arbitrarily different ways of trying to communicate something whose reality is independent of the language used to express it. So the idea of a writer having some form of ownership rights in the way she says something -- and basically, that's what copyright is all about -- goes against the grain. It's not only a nuisance, in that it puts annoying restrictions on our ability to quote other people's work in our own research and textbook writing, but it also seems fundamentally wrong-headed. Like putting up fences and "No Trespassing" signs in a national forest, it's not simply annoying and bothersome, but also seems morally questionable and undemocratic. Lawful perhaps, but in an ideal world, also unjust.

However, copyright is also the law of the land, and all of us feel both a personal and professional obligation to respect it, even if we regard it as problematic. That many of us do regard it as problematic, though, has led to a particular view of copyright that I think is a false one, and that has the dangerous and destructive potential to keep us arguing among ourselves instead of working together to solve our common problems. That view sees copyright law as a battleground on which two groups of rights struggle for dominance: the intellectual property rights of publishers and authors to capitalize on their copyrights on one side, and the public interest rights of libraries and users to gain access to information and ideas on the other.

According to this view, copyright law grants a kind of information monopoly to copyright holders, and monopolies, by definition, do not serve the public interest. They prohibit competition, and so prices are not established by the ordinary laws of supply and demand that should operate in a free-market economy, but are driven instead by the copyright holders' desire to maximize their profits. As a result, the cost of information has risen more quickly than inflation, and library budgets, which have been shrinking in real dollars as well as well as squeezed by inflation, are being doubly and intolerably pressed. In this view, then, libraries and patrons are locked in a struggle to free information from a legal but morally questionable monopoly created by copyright.

Some publishers do behave as though their copyrights gave them an infinitely exploitable monopoly, and have priced their publications accordingly. Ann Okerson's excellent analyses for ARL of serials pricing patterns build a convincing case against certain journals publishers. More recently we have the example, as reported in *Lingua Franca*,[1] of a press that has been confoundingly successful at selling what appear to be monographs with virtually no scholarly value to university libraries at some very pretty prices indeed.

But if there can be no question that copyright has been abused in some cases, I do question the conclusion that copyright itself is to blame. From the fact that some publishers have behaved badly it does not follow that all have, or will, and I don't think there's anything in copyright law itself that compels economic antagonism between authors and readers, or publishers and libraries. On the contrary, I think the law itself embodies and serves a powerful vision of the public interest. But to get at it, I want to back out of everything I've been saying about copyright for the last couple of minutes and come at it from a somewhat different angle, and one that has been missing from virtually all of the discussions about copyright I've heard recently: the author's.

Authors -- the word is a general term for all creators of copyrightable material, so I'm going to continue to use it even though it's awkward -- authors don't talk much about copyright, or even appear to pay much attention to it, but I don't think that's because they don't care about it, or think it irrelevant. I think they take it for granted. If they're commercially successful they probably have an agent to worry about the technical details, and if they don't, they trust

their publisher -- a trust, I feel obliged to say, that most publishers take seriously and do not abuse.

As you know I am a publisher, and in discussions of copyright publishers often claim to speak for their authors' interests. But I am also a writer who occasionally publishes something in this or that, and sometimes even gets paid for it, and it's as a writer, not a publisher, that I'd like to try to speak next.

The 1976 law itself grants federal copyright to authors for:

> . . . original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.[2]

Under the current law this statutory copyright begins at the moment I fix my work in a tangible form, so long as the work itself is "original" within the meaning of copyright law. This meaning is a good deal more specific than it is in common usage. Facts, scientific discoveries, ideas, theories, mathematical equations, and so forth are not themselves eligible for copyright protection no matter how new or original they may be in the ordinary sense, since they are presumed to exist independently of the language used to describe them, and so are common intellectual property. Copyright protects original expression.[3]

Currently, neither registration of the copyright nor notification through a copyright notice affixed to the work are required to establish copyright (although they are strongly recommended and will become significant if any later questions are raised about infringement). Under current law if I've written something down, and if it's original as that word is understood in copyright law, then I hold the statutory copyright in it.

This is an important change in the law, but not a revolutionary one. British and American common law have recognized authors' copyrights in their own work for several hundred years. Under the terms of the 1909 law that preceded the 1976 Copyright Act, an author's common law copyright ceased to exist upon publication, when the work either acquired a statutory copyright by being published with the appropriate notice, or it fell out of copyright into the public domain. If the work was not published, then under common law the author's copyright remained intact, in perpetuity. Under the 1976 law, because federal copyright comes into existence at the moment of fixation it now supersedes common law copyright, but the federal law still recognizes the underlying principle of the older, common law tradition: that the author is the primary owner of her work, and until she decides to make it public or the copyright expires, that ownership is virtually absolute.

So there is a long tradition in British and American common law which says that before everything else, authors own their work. The creation of statutory copyright, what publishers can and can't do, our notions of public interest and fair use -- all of those considerations, as important as they are, are secondary to that primary fact of ownership.

What does this kind of ownership mean to a writer, even an occasional writer like me? It means that, legally, the time I have spent reading and taking notes and trying to understand copyright, and then the time I have spent sitting at my word processor writing the paper you are now reading, all that has resulted in something. A piece of intellectual property: tiny and flimsy to be sure, but nonetheless as tangible in the eyes of the law as if I had spent my time painting a watercolor or composing a symphony. As a writer, the words on this piece of paper are my part of the rock, my stake in American culture, both the foundation and the guarantee of my belief that this country is shaped by books and ideas, as well as guns and money.

At this level, it doesn't matter whether this or that piece of my writing also has some economic value I can cash in on, any more than it matters whether I can find a buyer for the painting or an orchestra to perform the symphony. What matters is that copyright law grants me ownership of what I write, as long as the expression is original. And of course the law speaks to many more activities than just

writing. The word "author" in copyright law includes writers, composers, lyricists, computer programmers, architects, choreographers, filmmakers, playwrights, painters, sculptors, photographers, the designers of computer chips -- anyone who creates "works of art and literature . . . and works whose purpose is to convey information or ideas."[4]

When the Constitution describes the basis for copyright and patent law,

> The Congress shall have the power . . . to promote the progress of science and the useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries . . .[5]

surely it means that "progress of science and the useful arts" will take place only if creative work is encouraged by permitting authors to claim credit and be recognized for what they do, by acknowledging their contributions to our culture, by prizing the creativity of individual minds.

This is as true of scholarly writing as of any other kind. The direct financial rewards paid as royalties to an author for publishing scholarly work are dismally low, if they exist at all. But the indirect compensation for publishing work that is recognized as original by one's peers is substantial: tenure, promotion, merit increases, greater professional visibility, the ability to get grants, consultantships, a better job at another institution. Virtually the entire system of economic rewards and incentives for a member of the faculty in a research university is based on her ability, as a scholar, to communicate to the rest of the research community the results of her work, to claim it as her own. She won't get credit for thinking it up and precious little for teaching it, but once she writes it down and publishes it, then it becomes publicly and certifiably hers. As a kind of negative proof of the power this claim of intellectual ownership has in academic life, look at how quickly a finding of plagiarism unravels a career.[6]

The ownership principle inherent in copyright--that the author owns the specific form of her original work--has another consequence that is important for academic writing. It allows the author to maintain control of the exact wording of her text. If the text should become corrupt, copyright allows an author to say, these are the words I wrote and intended to appear over my name, and this is where the text was altered. Even if the entire system of scholarly publishing were completely subsidized by the university and university press books and journals could be given to libraries for free, as Sandy Thatcher has proposed, the need to maintain and certify the integrity of texts would still be a compelling argument for copyright.

Our society privileges creative and original work, and it does so because I think we recognize that the exercise of creativity and originality serve the public interest. The First Amendment is a different area of the law altogether, but it, too, says through the protection it extends to the communication of ideas that such things have special social value. We recognize the social value of original invention in patent law. In short, I think the idea is well-established in law that originality and creativity are in themselves a public good and that they deserve encouragement and protection.

Copyright encourages originality by establishing ownership, but it also encourages dissemination. Although we speak of it in the singular, copyright doesn't denote any one thing. It's a collective noun, and copyright is actually a bundle of five separate rights: the right to make copies of a work, the right to distribute those copies, the right to perform the work, the right to display it, and the right to create derivative works from the original. There are also what are called moral rights, but I'm not going to say anything more about them here, because they apply to only some visual works and even there have very limited application under U. S. law.

When an author signs a contract for publication of his work, the core of that agreement specifies how these rights are to be assigned to the publisher. In deciding how to make that assignment, a very interesting and useful property of copyright is that each of those five rights--to copy, distribute, display, perform, and create derivative works--is both separable

from the others, and also divisible. The range of possible divisions and recombinations of these rights is quite broad and we see them all the time. In the case of a very successful book, hardcover publication rights might go to one publisher, paperback rights to another, book club rights to someone else, film and television rights to a fourth party, and electronic rights to a fifth. The book might also be translated into various foreign languages, with a different publisher handling each translation, and negotiating further arrangements for foreign-language paperbacks, book clubs, and television mini-series.

This means that in addition to establishing ownership, copyright law also creates a flexible system through which copyrighted works can reach their audience. That audience may be reachable in one medium, or in half a dozen; in one language, or eighteen. It may be three hundred research libraries and a couple of hundred scholars, or five thousand subscribers to a journal, or millions of readers worldwide, and millions more viewers on television and film.

By establishing ownership, and then vesting that ownership in specific rights that can be transferred to someone else, copyright permits a publisher a reasonable chance of recovering the costs of publication. This is what makes the whole system of communications, including scholarly communications, work in this society, and it is where copyright law and publishing economics come together. There's no guarantee that expenses will be recovered; publishing anything is a gamble. But basically, if I have acquired the exclusive right to publish something, that means that at least I can go ahead without having to worry about the possibility that someone else will also be publishing the same work for the same market.

When you are publishing for small and specialized audiences, as all university presses do, the margin for error in establishing prices and print runs is very small. The costs of selecting manuscripts, preparing them for publication, manufacturing books and journals, selling and marketing them, and carrying on all the other activities that are required of a publisher have to be recovered from the sale of a number of copies that has been steadily shrinking over the last twenty years. And to add to the problems, our subsidies are being cut just as your support is. If we cannot maintain the necessary rights to what we publish and have to watch the demand for our publications -- in whatever form -- be eroded by unregulated dissemination of the same material, we'll be out of business.

Nevertheless, as long as all of us recognize these fiscal realities, the ability to split copyright into separate rights and to subdivide them offers us a good deal of flexibility in designing special licenses for specific purposes, like electronic distribution of journals. One promising avenue here is the negotiation of blanket licenses, under which a library might acquire the rights to provide a group of journals electronically to all of its patrons for a given period. I think this is a promising avenue to explore in that it seems to me to offer a way of balancing the rights of authors, publishers, and users without imposing an unreasonable burden on any of them. Janet Fisher, and Isabella Hinds from the Copyright Clearance Center, will each have more to say about licensing, and about fair use in their talks.

As it currently exists, I understand copyright law to do three things. First, it recognizes that creative people own the work they create. Second, by splitting copyright up into separate and individually divisible rights it creates a flexible legal framework that allows wide dissemination of copyrightable work, and also protects the underlying rights of ownership. And third, by protecting those rights of ownership and making it possible to recover the investment required for publication, copyright actively encourages dissemination.

If that analysis is accurate, then in my view copyright law as it stands does serve the public interest, and serves it well. That some publishers may take advantage of the law by charging excessive prices for their publications is a serious problem for all of us in the research community. If librarians are shocked at having to pay $5,000 for a year's subscription to a single STM journal, so are many publishers and scholars. Given limited budgets, we're all well aware of how just a few purchases by you at that level foreclose the possibility of wider purchases of other materials from us, and

restrict the usefulness of your collections to scholars in the social sciences and humanities. It's a truly vicious and terrible cycle: as you cut back your purchases and our sales drop, publishing costs have to be recovered from a smaller and smaller sales base just at the time that our own subsidies are being reduced or eliminated. And that can only translate into higher prices, which just makes the pressure on your budgets that much worse.

I don't have a solution for this problem, but I do have some suggestions where not to look for one. Trying to change the law is not the answer; that just puts us in a direct contest for Congressional attention with a lot of deep pockets whose interests lie in the direction of more restriction on copyright, not less, like very large high-tech companies that develop the operating systems and other software for personal computers. And working around the law just exacerbates the problems we already have. I think there are a number of interesting and promising avenues to explore -- new licensing arrangements; electronic publishing; greater involvement of the university, through its press, in the creation and financing of new publishing venues. But no matter what we do, we have to work cooperatively. Historically, philosophically, legally, and economically we are all part of the same institution, serve the same goals, face the same fundamental problems. Our fates and our futures are interlocked. Let's see if we can't find the answers together.

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[1]St. John, Warren. "Vanity's Fare." *Lingua Franca*, 3, no. 6.

[2]17 U. S. C. 102(a).

[3]Strong, William S. *The Copyright Book, A Practical Guide*,, 4th ed. (Cambridge: 1993), 3-13. The standards for originality in copyright law may also be considerably lower than most people have in mind when they use the term. In two recent cases the White Pages of a telephone book were found ineligible for copyright on the grounds that no originality is required to compile an alphabetical list, but the Yellow Pages were protected since they showed originality in the selection and arrangement of the entries. *Feist Publications, Inc. v. Rural Telephone Service Co.*, 111 S.Ct. 1282 (1991), and *Bellsouth Advertising and Publishing Corp. v. Donnelley Information Publishing, Inc.*, 933 F.2d 952 (11th Cir, 1991)

[4]Strong, p.1.

[5]*Constitution of the United States*, Article I, Section VII

[6]Copyright infringement and plagiarism are not, however, the same thing. Plagiarism is the use of someone else's ideas without attribution, whether or not the specific language in which the ideas are being expressed has also been taken from someone else.

The Role of Subsidiary Rights in Scholarly Communication

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In response to budget stresses in libraries, the continuing exponential growth of research being published, and persistently above average price increases particularly for scientific journals, in the last two years there has been a search for answers and responses by the university and library communities in particular. One such response has been the movement encouraging authors to limit the rights they give to publishers, in some cases to first publication rights only. Most of the parties urging these changes say that nonprofit publishers are not the culprits, and therefore not the targets, of these movements. But, like it or not, nonprofit publishers -- among them university presses -- are suffering from these movements. Copyright policy may seem to be the club that either side believes they can use against the other, but for either to use it that way has the potential to destroy the scholarly communication system.

In this talk I want to describe how the licensing of subsidiary rights works in the journals environment and how that would be affected by the initiatives going on to transfer copyright management from the publisher to the author or author's university. Then I want to touch on Fair Use -- the balance it is intended to create between the public's need for access to information and the publisher's need to recover its costs -- and end by briefly speculating on the concept of fair use in the electronic environment.

I have been listening to some of the copyright discussions going on in the last two years and have become very concerned about loss of access to journal material if some of the initiatives being discussed were implemented. I realize that I am in danger of sounding like a publisher with a vested interest in the current system, but I have discussed this with many librarians who also see serious problems on the way. We need to understand how the subsidiary licenses for journal material work today and why in order to understand what changes might occur if the management of copyright changed.

First, I see copyright as a tool for two things: (1) protecting the authority and use of the author's work; and (2) increasing the dissemination of scholarly research. I do not think of copyright in terms of control, which is a word I frequently hear others attribute to publishers and copyright.

At the present, most scholarly journals handle copyright in the following way:

- The author is asked to transfer copyright or a bundle of rights to the publisher.
- In return, the publisher grants back to the author the right to reuse his or her own work.
- The publisher registers copyright with the Library of Congress.
- The publisher handles requests from photocopy shops to make multiple copies of articles for classroom use.
- The publisher handles requests from other publishers wanting to reprint articles in books by other authors and other publishers.
- The publisher handles requests from other publishers to translate articles.
- The publisher licenses others to produce audio tape versions of articles.

- The publisher licenses secondary publishers to produce the issues in different formats (microfilm, microfiche, CD-Rom, electronic delivery, document delivery of articles in paper or other form).

Secondary publishers, or aggregators as I heard them called recently, are the focal point for a number of products that are increasingly important to the individual researcher and the library community. At the recent Charleston conference on issues in serials and book acquisitions, I heard much about how important these products are to librarians. I know that subscriptions to some of my journals have been cancelled because of their availability in full-text form in these secondary products. John Regazzi, from Engineering Information, H.W. Wilson, just described EI Reference Desk and was immediately surrounded by librarians wanting to know how to get his product. David Blair, from University of Michigan, has talked about the need for scholars to find their way through the mass of information available -- whether in print or electronic form. For journals, these bibliographic searching tools have been made available by commercial secondary publishers, and now because of customer demand these products are incorporating delivery of full-text in addition to bibliographic references. To quote from the Mellon report:

> Libraries themselves assumed responsibility for providing bibliographic information in electronic form about their monographic collections, as a continuation of the traditional cataloging activity. Information in electronic form about the serial literature, on the other hand, is in many instances provided by commercial services. The cost implication for libraries is significant. If they wish to offer a comprehensive array of bibliographic services, they must absorb the substantial cost of acquiring the commercial services, and in many instances members of the university community demand such services in addition to traditional acquisitions.[1]

Under the current system, journal publishers serve as the focal point for the production of secondary materials that are becoming increasingly essential to librarians, scholars, and students. That is, CD-Rom and on-line databases of indexes and abstracts that point to full-text of journal articles (either electronically accessed or print ordered), and document delivery services such as CARL Uncover, Faxon Research Services, and now Ebsco's CASIAS (Current Awareness Service/Individual Article Service), get their material through licenses with journal publishers or the Copyright Clearance Center (which has licenses with journal publishers). I have heard over and over again from librarians that faculty and students love these tools and that our publications have to be in them. But I believe these tools will not exist if publishers do not have the right to license subsidiary rights from authors. This is for two main reasons:

1. Publishers serve as the focal point for gathering rights. The secondary publisher has to make one license with one publisher in order to get a large body of content. The importance of the publisher as focal point can be seen by looking, for example, at the special issue of *Representations* that is available to conference participants. This journal has thirteen authors -- six from outside the U.S., one from private industry, one from Library of Congress, and five employed by universities in the U.S. It is important to note that less than half the authors are based at U.S. educational institutions, which are proposed to be the new copyright owners in some of the proposals circulating. Under proposals urging author ownership of copyright, the secondary publisher would have to get a license with thirteen different people in order to include the contents of this issue. None of the proposals circulating have discussed how to handle authors that do not reside at U.S. universities.

2. Publishers serve as the focal point for determining choice of content. The secondary publisher uses the reputation of the journal and the publisher to determine whether the material is appropriate for inclusion in its product.

This, I believe, is an even more crucial point. Without the publisher as the focal point, the secondary publisher would have to wait for publication of a journal issue, consider each article individually as to quality and appropriateness for their product, then find the author and negotiate the rights. I believe (and have confirmed this with several secondary publishers) that this would be totally impractical and would make the products both so expensive and so delayed as to be impossible to produce.

Then there are the document delivery services such as CARL, Faxon Research, etc. At the Charleston Conference I heard several things about the importance of these services:

- When we are deciding whether to subscribe to a new journal, we look to see if it is in CARL and, if it is, we don't subscribe.
- Money is being taken out of the serials budget and transferred to deposit accounts for document delivery services.
- Some librarians and consortiums are setting up their own document delivery.

In other words, everybody's doing it. But the same problems would apply as with the secondary publishers -- where to get permission to use the material and the possibility of waiting for material to be published and deciding on an individual article basis whether they want to include the article. (Of course, I assume here that these services will want to exercise some selectivity over quality or type of material.)

And, of course, there is the Copyright Clearance Center, not a document delivery service but potentially impacted by this scenario. Individual authors could register their articles with CCC and have them included in their voluntary permissions program. But how many authors would carry through with this? How many records would this require CCC to carry in their database and report on? Only a very small percentage of the total articles published are ever reused (or reported or requested to be reused) currently. Changing copyright ownership to individual authors would make the CCC grind to a halt, in my opinion.

So, is there room for compromise on the copyright issue? Yes, some. I believe publishers should consider doing the following:

- Explicitly tell authors what rights they retain and what permission they have to reuse their own material.
- When an author wishes to retain copyright, have other options available that allow the publisher to still license subsidiary uses of the article in order to not deter dissemination of the material.
- Explain to authors what publishers do with the rights they are asking for, and what benefit there is to the author and the scholarly community from the products and subsidiary uses those rights make possible.
- Make it easy for photocopy shops and professors to get quick permission to use articles in classes, such as blanket agreements whenever possible. (Note that blanket agreements are impossible in a world of different copyright arrangements from author to author.)

I urge publishers to consider the following policies:

- Allow authors to copy their own articles for use in their own classes without requesting permission and without fee to the publisher.
- If appropriate for the discipline, reduce the length of time for exclusive rights to the publisher as long as it can be followed with nonexclusive rights to the publisher to insure the continuation of subsidiary forms of publication.
- Allow authors to post early versions of articles on FTP sites if they point to the final authoritative version published in the journal.

These are all areas were customer demand is pushing compromises by publishers and where, I believe, our past traditions may not

necessarily be workable in the new scholarly publishing environment.

Fair Use

I would like to touch briefly now on fair use -- an important concept that tries to balance the need to have easy access to research with the need for the publisher to recoup its investment. This topic is becoming increasingly important today as evidenced by much talk on e-mail discussion lists urging librarians to aggressively push the boundaries of fair use (the use it or lose it mentality). This has a circular effect which is negatively impacting publishers -- not just commercial ones but non-profit publishers also.

This cycle begins with the library not having enough money to buy the materials it wants. It therefore cuts subscriptions to journals and tries to fill requests for articles from missing journals with interlibrary loan or document delivery systems. The publisher experiences a drop in institutional subscriptions with no increase in subsidiary income to compensate and therefore raises the price. Publishers can only respond to selling fewer subscriptions by economies in production and/or increasing prices. The publishers that will be hurt first and the most are those that price on a cost-recovery basis and not on a for-profit basis. Activities by libraries that are intended to extend the boundaries of fair use will ultimately come back in higher prices on either journal subscriptions or copyright fees. Fair use has got to be fair.

The second point I want to make is that we need to develop an understanding of what fair use will look like for electronic publications. I would like to believe that accommodation for fair use can be given in the electronic environment and that I will not have to charge every time someone (whether it be an individual or a library) browses an article in one of my journals. But librarians and publishers must work together to come up with an understanding of fair use that approximates what is currently available in the print environment and also takes into account the special qualities of the electronic environment.

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[1]Cummings, Anthony M., Witte, Marcia L., Bowen, William G., Lazarus, Laura O., Ekman, Richard H. *University Libraries and Scholarly Communication: A Study Prepared for the Andrew W. Mellon Foundation.* (Washington, D.C.: The Association of Research Libraries, 1992), 117.

Repertory Licensing in a University Environment

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Copyright Clearance Center

At the core of copyright is the promotion of scholarship, or in constitutional language, progress in the useful arts. The monopolistic right of the copyright holder, whether author or publisher, is balanced by certain special privileges, some ascribed on the basis of institutional identity, as with universities, and some on the basis of professional mission, as with librarians.

The copyright law is an equitable rule of reason and it has the demonstrated capacity for evolution. Interest in changing the law has diminished some in recent months and that is encouraging. Undoubtedly any effort to rewrite the copyright law would fall prey to a different law -- the law of unintended consequences. If there is any doubt that a law in flux would be more difficult than our current circumstances, just ask the Canadians.

The real challenge may not be the reasonableness of the law but the reasonableness of those of us -- librarians, publishers, authors and a host of intermediaries in the world of scholarly communication -- charged with making the law work. Or as those of us who recall Pogo might admit, "We have met the enemy and it is us."

Publishers and universities are beginning to reach for common ground for the management of intellectual property in an academic setting. Certainly there are a number of valuable projects going on in the university environment based on site licenses and other types of contractual relationships. At the Copyright Clearance Center, we have been engaged in the development of a different approach -- a repertory license for the university campus.

Before describing such a license, let me take a moment to describe CCC. The Copyright Clearance Center is a not-for-profit organization established in 1978. The CCC Board is comprised of publishers, authors, and users of copyrighted material. Current Board members include a university press representative, Sandy Thatcher of Penn State, and a university representative, Stuart Lynn of Cornell. CCC represents the works of 8600 publishers worldwide, and provides licensing systems to commercial corporations, document deliverers, special libraries, and producers of university coursepacks. After approximately ten years of development, the corporate licensing program returned over $15 million to publishers in 1993. After only two years of operation, CCC's coursepack program, the Academic Permissions Service, has returned just over a $1.5 million to publishers and their authors.

CCC also serves as the Reproduction Rights Organization (RRO) for the United States, linked through the International Federation of Reproduction Rights Organizations to counterpart agencies throughout the world. Through bilateral agreements with other RRO's, CCC has repatriated to the US royalties collected on behalf of US rightsholders in Norway, the United Kingdom, France, and Germany. Elsewhere, repertory licenses are a well developed feature of the academic landscape.

CCC actually must concede that it is only the second most experienced administrator of repertory licenses in the United States; ASCAP is older and larger. There is, incidentally, one critical difference between CCC and ASCAP. ASCAP will sue for copyright infringement while CCC, as a matter of policy, does not. Lest we miss the point that sticks can play an important role in copyright compliance even though carrots are the tool of choice, ASCAP's

return to rightsholders currently runs eight to ten times that of CCC.

In 1989, CCC initiated a project for developing a repertory license for the university environment, adapting the most compelling features of our current corporate license to the needs of academic institutions and testing those features against the real world needs of academic institutions and the authors and publishers who serve them. The pilot involved six colleges and universities and approximately 150 US publishers as well as those publishers in the UK registered with the Copyright Licensing Agent, the RRO in the UK. Since the two year run of the pilot, CCC has held several conferences for selected participants. Our observations on university licensing are based not only on the data collected during the two year pilot but also on subsequent "debriefings" of those who participated.

Based on the data from the pilot, as well as the perceived needs and interests of both rightsholder and university participants, the essential features of a repertory license for universities must address access to an extensive and constantly expanding repertoire of works

The diversity of material of interest within any academic institution is literally unbelievable. In CCC's coursepack program alone, we identify, on average, ten (10) new rightsholders a day who must be added to CCC's existing data base of 8600 rightsholders. In just two and a half years, coursepack requests have been received for over 7000 different rightsholders.

Another feature of a repertory license for universities is a broad grant of rights that permits a range of uses, both predictable and unanticipated, and meets the various needs of faculty, students, staff, and administrators. In addition to seeking access to a virtually endless body of material, the scholar seeks freedom to use information in a variety of ways and with an immediacy that is perceived to exceed the standard of timeliness and ease associated with the traditional permissions process. Moreover, the diversity of materials from journals to textbooks, the options for media from print to electronic formats, and the entire set of users from faculty to students to staff must all be addressed within reasonable parameters.

The current time and attention devoted to the growth and evolution of information technology should not obscure the real and immediate needs for practical solutions to large scale problems related to photocopying of print material.

Flexibility in the grant of rights and in responsiveness to evolving technology will grow more important in licenses as the electronic future comes closer. That future is very likely to outstrip our ability to define, measure, and value information in ways that can be reduced to precise agreements with reasonable life spans. Broad principles, inclusive arrangements, and practical agreements will be far easier to sustain

The needs of a broad range of rightsholders and academic institutions must also be addressed when developing a repertory license for universities. A model that is suitable only for large publishers, whether journal or text, and large research institutions would be corrosive to the needs of the broader scholarly community which includes smaller institutions and such scholarly publishers as not for profit societies neither of which have the resources to protect their interests individually.

Particularly important to the university itself is that the license functions largely independent of end user behavior and/or knowledge of or commitment to the copyright law. End users are very likely to be the least informed and the least motivated in understanding copyright and in conforming their behavior to its expectations. An individual scholar's view of these issues is likely to be driven by the hat of the moment -- whether as author, teacher, or scholar -- rather than by a view of the verities of intellectual property or for that matter by university policy on copyright. We've all heard the scholar wax lyrical over the free flow of scholarship on the net within his or her discipline only to turn shortly after and demand the latest royalty statement from the publisher of a recent textbook.

The repertory license for a university should recognize fair use and library privileges (sections 107 and 108) in an administrative fashion that respects those prerogatives, but is not excessively burdensome. These privileges, described in sections 107 and 108, are alternately described by librarians as rights, by publishers as defenses against infringement or, getting into even deeper waters, by Jane Ginsburg in the publication circulated at this conference as subsidies to scholarly publications. Repertory licensing, with administrative mechanisms for accommodating these positions practically, can resolve a philosophical impasse.

The repertory license must cross national boundaries easily. Copyright laws themselves vary widely. The rationale behind those laws also vary widely. As information becomes ever more global, it will be increasingly important that domestic licenses are supported by an international network of agreements and understandings.

Another important feature of a repertory license is that it relies on just in case not just in time pricing. Pricing strategies in a repertory license would need to rely on a series of collection and distribution algorithms that would combine broad access to materials with predictability of pricing for academic institutions and some certainty of broad compliance with copyright on a university's campus with reasonable valuation of their materials for authors and publishers.

CCC's experience in the corporate market confirms over and over that extensive authorized access to copies of information at a price that is perceived as reasonable and under systems that do not interfere significantly with access to information build demand for the original product. The most frequent response of librarians to survey data demonstrating high use of a particular publication by photocopying is to order additional copies of that publication.

On balance if the cost is more than universities want to pay and the returns to publishers less than they expect, the negotiations between the parties may well be deemed a success.

It is also important not to spend dollars to collect dimes Expressed in a different way, the value attributed to the intellectual property must substantially exceed the cost of the administrative systems to protect that property. The decided attractions of highly particular systems for both rightsholders and academic users aside, such approaches demand complex, and therefore expensive, administrative procedures and systems support.

In order to achieve repertory licenses, we must identify solutions to some difficult obstacles:

- Differences of interest within the publishing industry

Journal publishers are keenly concerned with library copying, as well as the transformation, legal and otherwise, of their materials into electronic forms which are subject to a variety of uses not contemplated in a print world. Text publishers, however, are focused on the steady growth of coursepacks and custom publishing .

- The "back room" problem

Publishers cannot license what they do not own; the rights conveyed by the author in any instance may vary. Access to contracts and documentation may well be fragmented, particularly for older materials. There must be some consensus among publishers and between publishers and authors that their common interest in copyright compliance is more binding than their differences so that reasonable accords can form the basis of licensing agreements and pricing models.

- What has never been successfully engineered, cannot readily be automated

The existing systems for permission and/or site licensing of materials accommodate only a small fraction of all the material that is copied and disseminated now. Assuming considerable latitude under copyright for academic institutions and their educational mission, there is still a tremendous volume currently of unauthorized copying. The promise of technology is only that of measuring large numbers of very small transactions; technology also carries an inherent demand for rules and standards which will pose a decidedly more

difficult set of problems given the variability of current practices in the permissions arena.

Repertory licensing in academic institutions will require extensive cooperation, creativity, and clarity of interest on the part of authors, publishers, librarians, scholars, and university administrators. The good will building among those constituencies must soon translate into broad based agreements on uses, terms and conditions, and above all, pricing models.

The promise is real, as long as the visionaries are not so imperious about the technologies of the future that we cannot deal with the technologies of the present. And so long as the advocates of principles know when to quit staking out turf and start designing solutions. And, above all, as long as the lawyers do not wind up with control by default, developing a system so complex and/or so open to argument, that only they can decipher it.

If scholarly communication is about wisdom, not information, and if the lines of communication remain open, the promise is great.

Why Are There Still Lines at the Teller Windows? Coping With the Information Revolution on Campus

(Or, If You lie down in the Middle of the Data Highway the Search Engines Passing By Will Still Generate Multiple Hits)

David A. Hoekema
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Philosophers tend to think in abstractions. Let me begin by flouting the stereotype and telling a few stories.

The first was relayed by the originator of the Intelex "Past Masters" electronic texts of major philosophical works. In the course of several exchanges by e-mail in recent weeks, I asked him for examples of the ways in which philosophers' work had been affected by the texts that he publishes on CD-ROM and disk. In reply he cited an American Philosophical Association convention at which a senior scholar -- a recent President of the Eastern Division of the APA--dashed out of a colloquium to Intelex's display in the book exhibit area and asked the representative to run a quick search for a certain phrase in Locke's *Essay Concerning Human Understanding*. The search took just a minute or two: no, the phrase does not appear anywhere in that sprawling text. Back to the session went the inquirer. An hour later, a somewhat dejected philosopher came to the booth and requested the very same search. At his session, he related, he had cited that phrase as occurring in the *Essay*, and used it as a basis for his interpretive comments. But at the end of his paper he had been ambushed by a senior colleague who claimed confidently that the reference was mistaken.

The second episode I will retell occurred just last week as I was preparing this paper. I read in the *Chronicle of Higher Education* of a new search utility at the Library of Congress, and decided to see whether I could give it a test drive using my Gopher server. As a Gopher neophyte I did not know where to look for LC resources, but I found a young woman named Veronica who led me quickly to a menu where I found the option I was seeking. Out of curiosity, I was timing my search: within 4 minutes of accessing Gopher, I was at the very door of the LC's newly opened electronic hall of marvels. Alas, I had no key. "Missing parameter--server terminated--core meltdown imminent," mumbled the doorkeeper, or words to that effect.

On the same menu I found another promising option: information on an LC conference on Project Gutenberg and electronic texts. I asked to have a look. Five minutes passed, then ten. Finally the document appeared. It looked promising, but I was due home for dinner, so I mailed myself a copy, exited, waited a few minutes for the mailman to arrive, extracted the file to disk, and asked a DOS utility to print a copy for me. Again, a long wait. I killed the print job, which brought the printer miraculously to life and produced the first ten pages. Meanwhile I began copying the document to a floppy to read at home. No such luck: it was too large for a floppy disk. What I thought to be a brief summary of a conference turned out to be a half-megabyte monstrosity, although nothing on the menu or the means of access gave me any hint of its size. Rather as if I had found a slim monograph with a promising title on the library shelf, only to discover, as I tried to slip it into my backpack to bicycle

home, that it was really a 12-volume work weighing 60 pounds.

Electronic access, I conclude, is both more useful and less useful than it ought to be. We have a long way to go before it fulfills its potential as an aid to scholarship, but it is also serving unforeseen purposes. Electronic aids intended to assist careful study prove useful for professional sniping. New opportunities for communication also serve the needs of data thieves and plagiarists. Remarkably user-friendly and flexible access structures such as Gopher are prone to failure and can yield booby traps.

But I could balance every story of misuse or frustration with another story of how electronic links have speeded and enhanced scholarship. Here, too, I can be personal. Two weeks ago I finished an essay on ethics in teaching, and within half an hour after finishing my revisions I had not only submitted the manuscript to the two editors, at different universities, but had received an acknowledgement from each that it had arrived safely. More impressive still, a colleague in mathematics told me last week that he had just received page proofs from a research journal published in Germany, to which he had submitted his 100-page manuscript, studded with mathematical formulae, just a few weeks earlier via e-mail. The only inaccuracies he found turned out to be his own mistakes.

What is the state of electronic publishing and information access on campus? To judge by my medium-sized Midwestern liberal-arts college campus: it is a remarkable hodgepodge of sophistication alongside ignorance, of highly developed and widely used systems alongside the most primitive beginnings. And the places where each of these can be found defy all stereotypes. Members of one of our natural science departments are finally scheduled to get personal computer's this year: they hadn't asked for them before, and never saw much need. (They already had computerized laboratory instruments that cost more than a lifetime subscription to every philosophy journal published.) But one historian was combing the campus last year in search of a fast enough 486 to run the CAD software that he needs to use to study artifacts from an archaeological dig. (The Engineering Department agreed to let him borrow one.) One member of the support staff in my office is so adept with computer programs -- including an administrative mainframe system that seems to me to have had "user intimidation" as a principal design criterion -- that she is regularly called on to tutor her bosses. Another support staff member in another office, I learned last week, has been using WordPerfect for six months but hasn't yet quite grasped the concept of filenames. Half a year's work is saved in one gigantic file.

But enough of stories. Let me turn to the questions that the organizers of the conference asked me to address. What are the principal needs of scholars for information that can be delivered electronically? What is it that scholars and researchers need, and electronic publishing channels can provide?

To answer the question, let me suggest that we divide the information used in scholarship into four categories: first, bibliographic data; second, quantitative data; third, ordinary text; and fourth, multi-media material. The situation on campus is quite different in each of these categories.

First, consider the computerization of bibliographic material, including both library catalogs and indices of publications. Here the computer has already won the contest with printed information. Go to any of the dwindling number of libraries where the computerized catalog duplicates the card catalog, and count the number of people using each. Computerized access is quicker, more convenient, and in no way less useful than flipping through drawers or paging through bound volumes. Scholars use printed bibliographies when they are not available online or on disk, but not when they have a choice. This change appears irreversible, especially since -- once the initial transition is over, and all the records transferred -- electronic catalogs and bibliographies are far easier to maintain, correct, and update than are their printed equivalents.

In this area, and this one alone, there are few important unmet research needs that are not in

the process of being addressed. Some libraries maintain computerized records only of new acquisitions -- a hybrid system in some ways less satisfactory than the old one. Foreign language materials need more consistent standards and more convenient access. Some bibliographic sources are priced so dear that they are difficult for small libraries to afford -- the major bibliographic tool in my discipline of philosophy being a noteworthy example. But these problems have obvious solutions. The challenge for the future lies principally in melding and integrating various information sources. A researcher of the next generation may be able to search the ten nearest university libraries, or six different bibliographic databases, with a single natural-language command, rather than query each one separately using a primitive Boolean syntax.

What of the second area of information: that of quantitative data? Here I have in mind census data, survey results, experimental data in the natural sciences, and the like. Computerized analysis of quantitative data was one of the earliest applications of computers. One of the benefits of increasing speed and memory of microcomputers has been the transfer of statistical analysis from mainframes to PC's. Such analysis has proven to be essential to both the natural and the social sciences. Electronic exchange of data is not yet as familiar or as routine as the exchange of texts, but its importance to scholarship is increasing. If I pass over this application quickly it is because of my limited experience and knowledge, not because I judge it of secondary importance. Those who work regularly with quantitative data will need effective means for their dissemination and consistent standards to enhance their usefulness. Whether there are significant technical hurdles that need to be negotiated in meeting these needs is a question that I am not able to answer.

Third, and closest to the heart of research in the humanities and the theoretical side of the sciences, is the category of ordinary text -- from research notes to encyclopedias, from introductory textbooks to the most abstruse articles. Such texts are the lifeblood of the university, the source as well as the product of the faculty's wisdom. In what ways has computerization changed the traffic in texts? In this case I will subdivide my category into three subcategories.

First, consider texts that circulate actively for a short period after their creation: reports of research in progress, drafts of articles, comments on recent work, reports on recent developments. For such texts, electronic exchange offers enormous advantages over the alternatives, and it is already very widely employed. The Internet, like the cash machine, is a convenience that we lived happily without until we learned to use it -- but today we could not imagine life without it. The rapid growth of such exchange has created unforeseen problems of privacy, accessibility, and quality control, and it has challenged the very notion of copyright in a published work. Not every scholar yet has access to electronic means of communication. At the small Midwestern college where my sister is a faculty member, there is one terminal in the library with access to Internet, and faculty members line up to use it. With each passing month, the number of e-mail users in the academy grows by a large margin, and those still outside the net feel more isolated.

But in a second category of texts--the fruits of research in larger pieces, in more final form -- the reign of the printed word has not been seriously challenged. Scholars prefer to read journals and monographs on paper, and electronic communication has been most successful when it simply serves as a means of producing printed text on demand. There are electronic journals in various fields, it is true, but they remain largely the domain of hobbyists. Sony's digital book, introduced with great fanfare, has been ignored by a public that insists stubbornly on buying words between bound covers. Scholars are if anything even more traditional when it comes to studying their colleagues' research work.

Yet we can mark off from these works of current scholarship a third category of texts in which electronic dissemination has gained a large base of users already: the primary sources of literary, historical, and philosophical study. Ironically, the greatest success of electronic text distribution has probably been in the most ancient texts: the *Thesaurus Linguae Graecae* is an indispensable resource for classicists, and

the Latin corpera now under development have already attracted wide attention. I have already mentioned the philosophical texts that can be purchased on floppy disk or CD-ROM: they include the British philosophers from Hobbes to Mill, translated writings of the Continental Rationalists, and the works of Aquinas, Descartes, and Kierkegaard both in the original and in translation. The list of literary works available in searchable electronic form grows longer each month.

Why are scholars willing to tolerate the eyestrain of studying Hobbes or Jane Austen on screen, yet insistent on bound journals, or at the very least printed copies of electronically distributed journals? The reason lies simply in differing patterns of use. Any text for which one might have reason to use a concordance is a text highly suitable for electronic distribution. Computerized search procedures amount to an infinitely flexible concordance, written to order for each user. The principal barrier to wider use of electronic primary texts is probably their cost -- particularly since the electronic texts are almost always used as supplements to, not substitutes for, bound copies of the same texts, open on the desk.

Let me turn to the fourth category: that of multimedia research materials. To the extent that this term is used for "hypertext" informational and instructional resources it is an exaggeration, for most such resources simply rearrange text and dress it up in graphics designed to invite exploration, with images employed as illustrations. I confess to being something of a skeptic concerning the hypertext revolution that some of my colleagues believe we are entering: the value of such applications for instruction is considerable, particularly for those reared on video games, but their use in research tools is very limited. But you may well wish to discount this as an expression of nostalgia more than reasoned judgment, coming from someone who still uses an IBM clone, drives a stick shift, and listen as often to LP's as to CD's. (LP's, for the younger members of the audience, were an aesthetically superior multimedia music delivery system, with a capacity for 17" diagonal high-resolution color graphics on the cover, recently elbowed out of the marketplace by shiny little discs that are easier for the fumble-fingered to use and generate much higher profit margins.)

True multimedia information resources are at this point only in their infancy. Today they include CD-ROM encyclopedias with integrated video and sound clips, interactive CD applications for training and medical diagnosis, and laserdisks linking a feature film to texts, photographs, and recorded interviews to aid in its study. Tomorrow we may be able to "read" a paper in music history on a disk incorporating its musical illustrations, or study an architectural drawing by walking through the proposed building first in daylight and then in the evening. Capacities such as these, within the scope of current computers but not yet well supported by software, will doubtless bring many changes to the scholarly use of non-textual material.

Rather than speculate further on such future possibilities, however, I want to return to my central question: what do scholars want, and need, in an information storage and retrieval system that electronic publication and dissemination can provide? It is important to remember that -- for a profession as conservative as that of scholarship in the humanities, social sciences, and arts -- the first priority of scholars is to find means of doing more effectively exactly what they do now. Hence the importance of the electronic applications that are least innovative technically, such as bibliographies and searchable texts. For philosophers, historians, students of religion, musicologists, and even researchers in the natural and social sciences in much of their work, the first goal of electronic publication should be to make the same tasks that now take an hour in the library feasible in ten minutes at one's desk.

And then -- with the time freed from tedious pursuit of highly specific information in print sources -- scholars even in the most traditional disciplines will discover new working methods and new modes of analysis that can only be undertaken with a computer's aid. Searches and comparisons that would have required a year's careful reading and note-taking may now be completed in a few minutes, then repeated again and again with small revisions as new syntheses and relationships emerge.

Traditional methods of interpretation can be enriched by quantitative study. A classicist can confirm her hunch about the tone of an ancient writer's vocabulary by verifying that he is using verb forms common in legal documents but seldom used in drama. As non-text material is added to a variety of texts, new cross-disciplinary insight will offer themselves.

Will the electronic revolution "change everything," as is often loosely forecast? Will the roles of information providers, users, and interpreters change radically on campus? I do not think so. Incremental changes are already evident. The roles of librarians, computer center staff, and faculty members are in a period of fluidity and uncertainty -- with the result that mismanagement in any of these linked areas can have disastrous consequences for all. The computerization of information also offers a new arena in which departments and academic units can compete with each other for resources and for prestige or, if a cooperative spirit prevails instead, can assist each other enormously.

Let me conclude my remarks by identifying one major benefit of the growth of electronic information, then a major cost, and then a major change in patterns of scholarship. The benefit is this: increasing reliance on information accessed and obtained electronically offers a potential solution to the impending catastrophe that seemed bound to result from increasing faculty demands for specialized research materials, on the one side, and spiraling costs of journals and monographs, on the other. By judicious and cost-effective substitution of electronic resources for print materials, both library resources and faculty research opportunities can expand without breaking the budget. Or, to put it differently: in the electronic age, the new university library can be ten times larger on the inside than it is on the outside.

The cost that I have in mind may seem almost too insignificant to mention, but it is one that has troubled me in recent weeks as I evaluated research leave proposals from my colleagues. Increased electronic access to research resources greatly diminishes the incentive to leave one's academic home to conduct research. But the experience of perusing documents unearthed by Gopher is altogether different from that of arranging a visiting appointment and conducting research in another academic community. The Internet is only one of many factors conspiring against the traditional sabbatical away from home. Others include the weak dollar, the two-career marriage, and cutbacks at the institutional and the national level in research and travel support. But the Internet plays a role, too, in making it too easy to stay home and thus to miss the stimulation of new colleagues and surroundings.

And what is the change in scholarly habits? It is a major shift in ways of creatively wasting time. In the old library, you would look along the shelves for the book you wanted, pull out two or three others with intriguing titles, and -- from time to time -- from such distractions would come important new insights. The very proximity of books on the shelf served to suggest relationships and new perspectives. Gopher's shelves are far more easily traversed -- from one end of the world of knowledge to the other in a few keystrokes. Idle wanderings in the electronic stacks may lead to strange and unfamiliar juxtapositions, and seemingly wasted time may yield very different results than when information is arranged on physical shelves.

Some may fear that the electronic information revolution will render obsolete the skilled guides who now aid with information access: the librarians who help users find relevant reference works and resources, the publishers who both select and shape research results, the senior scholars whose work helps others assess emerging lines of investigation. When information is so readily gathered from the corners of the intellectual earth by one person at a screen, library staff may be reduced to maintaining software and aiding novices, rather than lending expert assistance to advanced researchers. Publishers may simply turn from scholarly publication to other endeavors as researchers post their results on networks and refine them through frequent communication.

But this fear is, I think, unfounded -- just as it was unrealistic to expect that installing cash machines would put bank tellers out of work. There are still lines for the tellers, after all --

for the simple reason that not everything we need from a bank can be provided by a machine. Sometimes we need to complete a complicated transaction, or correct a mistake, or simply talk to a human being about how to do something. For similar reasons, in information retrieval, we will always need interpreters, evaluators, and guides, even if our more routine needs will be met more efficiently by typing at a terminal. The revolution in electronic information will be less a revolution than an evolution in roles for the academic community.

Six weeks ago I was in Xi'an, China, and saw there what must surely be the ultimate hard-copy backup system. In the ninth century the emperor decided to make an authoritative copy of the Confucian texts and the *Spring and Autumn Annals*, a history of China, and had the entire text inscribed on 140 large stone tablets, each of the 560,000 characters verified for accuracy by leading scholars. (Half a mega-ideogram, was the term the emperor's MIS director probably used.) The stone steles still stand in the Confucian temple of the ancient capital, where they were placed in the eleventh century. Storage does not get any more archival than that.

When I studied the classic texts of Western philosophy in graduate school, I had my own printed copy to consult. But the means I would use to search for a passage were not very different from the methods of a scholar in the emperor's court--skimming through the text, consulting my notes, looking for the right passage. Today, if a graduate student has a computer and a few hundred dollars, she can search the whole Platonic corpus in a few minutes, and call up relevant passages from Sophocles and Aristophanes in a few more. Yet even when the whole Western and Eastern cultural patrimony has been mounted in a digital chip incorporated into everyone's pocket cellular telephone, the need for explanation, interpretation, and conversation will remain, and it will not be met by machines. We will still be lining up for the teller windows.

Redesigning, Not Reinventing, Encyclopædia Britannica

Joseph J. Esposito, President
Encyclopædia Britannica Publishing Group

I would like to begin by thanking Ann Okerson for inviting me to speak here today. Last year I had the privilege of attending another meeting of this group and spoke about some of Britannica's plans for electronic publishing. Part of what I want to talk about today represents something of a status report on some of our projects. I would also like to extend my remarks, if I may, to other aspects of our strategy, in part because we are beginning to see at Britannica how digital media will affect our entire operation: how we develop products, how we distribute them, and the economics of being in the business of publishing intellectually serious works.

When Britannica first began to look into electronic publishing, we started with the obvious assumption: an electronic version of *Encyclopædia Britannica* should be more or less similar to the print version, that is, it would have the same number of words, and, if we could clear the rights and the technology was compliant, it would have all the pictures as well. Later we began to think of multimedia: we would add audio and video to the product and make the electronic *Encyclopædia Britannica* in some respects superior to the print version. At this point, someone jumped up and said, let's make it even bigger! So we put together some plans to add new articles to the encyclopedia, since the constraints print puts on length do not apply to digital media.

In retrospect, all of this early planning seems touchingly naive. What we had been assuming was that electronic versions would essentially replace print versions. We assumed that for all the changes in media, our contributors would still write articles the same way, the articles would be edited the same way, and the product would be marketed and distributed the same way. It did not occur to us until much later that our entire business would be destabilized. New media challenges every aspect of the publishing process, from product design to pricing to distribution. We soon realized that creating an electronic encyclopedia was the least of our problems. Coming up with a new business model was the real headache.

Some people were thinking about these things long before we were. As we sit here a great drama is being played out in the pages of the *Wall Street Journal*. It is the drama of convergence that Nicholas Negroponte predicted would take place. The convergence is of various industries -- computers, telecommunications, and publishing -- which heretofore were thought of as separate and distinct but now are believed to be linked in an age screaming for information. The drama takes the form of mergers and acquisitions. Paramount attempts to merge with Viacom, but the marriage is interrupted by Barry Diller of QVC; but before that battle is completed, Diller's backer, John Malone, sells out to Bell Atlantic. In the meantime, Nynex takes a position with Viacom, the Newhouse family teams up with Diller, and Bell South also dips into its pockets to help Diller steal the bride on her way to the altar. Meanwhile, back at the ranch, U.S. West has invested in Time Warner, Microsoft is in league with General Instruments, and AT&T's Robert Kavner has pronounced that "content is king." The gods walk the earth and mere mortals must stay out of the way or be crushed underfoot.

What is certain is that if the bride is Paramount, the price for her hand is way out of proportion to her charms. In fact, the merger of Telecommunications, Inc. and Bell Atlantic is worth over $30 billion, significantly more than

the entire Hollywood film industry. So clearly the bets that are being placed are for more than the right to deliver Eddie Murphy and Arnold Schwarzenegger movies into everybody's home. Nor can the book publishing industry make up the difference: with total revenue of under $20 billion, the entire U.S. book publishing industry is a tiny mole on the backside of the communications industry. No, there is something mighty peculiar going on.

What is going on is a calculated gamble: the bet is that a huge number of information services, most of which are not even invented yet, will come into being to fill the national data highway. After the big boys tie up the rights to Hollywood movies, television reruns, and sporting events, they will come looking for more specialized wares. It appears that we will soon see the creation of the scholar's channel. Yes, our worst fears -- or dreams -- may be realized, and networks, desperate for programming, may soon try to acquire university presses or Encyclopædia Britannica. We may someday find that the world's largest research library is a division of Time Warner.

We can argue whether this is a good thing or a bad thing, but it is certain that, good or bad, all publishers, even academic ones, have to be prepared for this state of affairs. At Britannica, we began to prepare a product that would make *Encyclopædia Britannica* available online. The name of this product is, predictably, *EB Online*. It is in alpha testing now and will become available in September 1994.

Our first idea for *EB Online* was to create a text-only version of the encyclopedia and install it on campus networks. The reason that the initial release would be text-only is that most computers on campus networks are actually dumb terminals, and even the computers that could support a graphics interface generally run in VT 100 emulation mode. So the academic world was not ready for multimedia, and even though things are progressing, that is still largely true today.

Eliminating the illustrations from *Encyclopædia Britannica* was not something we were eager to do. There are 23,000 illustrations in the encyclopedia, many more than are in most books dedicated to the pictorial arts, and to drop all those images meant diminishing the editorial quality of the product. But even harder to give up than the illustrations are the so-called embedded graphics that cannot be displayed on dumb terminals. Embedded graphics include such things as special characters, musical notation, and mathematical symbols. Ten percent of the encyclopedia's articles would be affected.

What happened next caught me completely by surprise. We did a survey of people working in the academic library community and were told that graphics could wait; the important thing was to make *EB* available online as soon as possible. Our respondents said that the primary thing was the 90% of the articles that did not have special graphics, and that the academic library world could wait for graphics until the installed hardware base improved.

I was astonished by this market research for a number of reasons. First of all, it was heartening to see that some people still subscribed to the primacy of text and that Mario and His Brothers have not set the standards for academic publishing. Secondly, it was gratifying to learn that there was a strong pent-up demand for having *EB* made available in electronic form. (It would be an understatement to say that this was gratifying.) But the third point is the most important of all: the level of sophistication concerning electronic publishing in the academic world was far beyond anything we had anticipated. We were very proud of ourselves to have thought to ask.

So we made the decision to roll out *EB Online* in stages. The first version, 1.0, will be ASCII, or text-only; Version 1.1 will support at least the Microsoft Windows graphics display; 1.2 will support the Apple Macintosh; and 1.3 will support Sun Microsystems' platform X. Our first lesson in electronic publishing was that we could allow our products to evolve with the marketplace and that our customers would work with us to help us evolve.

While we were working on these questions, we were also tackling the problem of getting the encyclopedia onto a university network. We began to work with the University of Chicago,

with which Encyclopædia Britannica has a longstanding relationship. And then we ran into a big, big problem: we discovered that to install the database would cost us about ten times more than we could hope to earn in licensing fees. This meant that from an investment point of view, it would take ten years for us to break even. We are all in favor of long-term thinking, but this was simply unacceptable.

It was when we withdrew from the battle to lick our wounds that we discovered Internet. We realized that if we could make *Encyclopædia Britannica* available via Internet, we would not have to install it onto every interested campus network. Instead, we could develop the product once, and then sell subscriptions to colleges with Internet access.

This is precisely what we are doing. *EB Online* will run on a WAIS, Inc. server, which supports the Z39.50 protocol. If those technical terms sound like gibberish to you, fear not. All they mean is that we are using a widely accepted standard for Internet access. Our system is up and running now. In January we will set up the first beta site at the University of California at San Diego. We are seeking to identify two or three other beta sites now. The product will be completed by early summer. By using the WAIS software, we will reduce our costs to a fraction of the first plan. These savings will be reflected in our pricing. Currently a print set of *Encyclopædia Britannica* costs around $1,500, but the online service will only cost about $1 per student subscriber.

Before going any further on EB's plans, I want to return for a moment to the merger of Bell Atlantic and TCI. As I said before, in 1993 anyone who wants *EB* has to pay $1,500 or more for it. Soon, because of the creation of a national data highway, the cost of information will plummet. Not many people can afford the $1,500 for *EB*; we reach about 100,000 customers a year. With substantially lower costs, we could make *EB* available to many more people. Now, I do not want to suggest that universal access to *EB* will cure all the world's social and political problems, but on the other hand, I do not think it can hurt. For this reason, I do not begrudge John Malone his billions, as long as the distribution infrastructure he is creating is made available to us without prejudice and for a fee that we can afford. If that means that Arnold Schwarzenegger will in effect be helping to make more widespread dissemination of *EB* possible, than I am all for Arnold Schwarzenegger.

There is a tendency, I believe, for people involved with electronic publishing to think in terms of ultimate solutions. *EB Online* potentially is one of these ultimate solutions. Ultimately, everyone everywhere will have access to the global telecommunications network. Unfortunately, most people don't live in ultimate places; they live in stopping-points along the way, places like Bayonne, New Jersey and Morton Grove, Illinois. Our experience is local and particular, and it would be unrealistic to expect everyone to have access to *EB Online*. For that matter, we know that some people who could have access to a network wouldn't want to use it, so it is important for us to develop a strategy to reach these people as well.

This was a startling conclusion for us at Britannica for the simple reason that, for the first time, we understood that in the future -- and that future is 1994 -- there would not be a single edition or version of *EB*; rather there would be multiple versions, the form of each tailored to customers' needs, wants, and access. *EB* would no longer be a literal artifact, a set of 32 volumes in handsome bindings; it would now be a database, or a knowledgebase, that exists in some abstract way as a potential product, a product that becomes actual or is given form only when a particular market opportunity comes calling. This is unsettling; it sounds like mysticism or quantum mechanics: suddenly *EB* doesn't seem so solid.

Although my colleagues are not united on this issue, some members of the Britannica staff are forging ahead to come up with multiple *EBs*. I will anticipate a question and say that, yes, indeed, there is internal opposition every step of the way. Some members of the Board of Editors are outraged that we are tampering with our patrimony; some members of the direct sales force are annoyed that we are tampering with their paychecks. But we will proceed until we get fired; and that is not so bad, because we are confident that the people who

replace us will study the situation and independently come to the same conclusions. At the outbreak of a fire, everyone independently concludes that it is time to get to the exit.

One of the new electronic editions of *Encyclopædia Britannica* we are creating is called the *Britannica Instant Research System*. Some of you may already be familiar with this product. One of my colleagues will be demonstrating it here tomorrow morning. The *Britannica Instant Research System* represents a different implementation of the *EB* database. It can run on a powerful personal computer or on a local area network; Internet access is not required.

We began to work on the *Research System* about a year-and-a-half ago. Actually, the project grew out of a scandal. I imagine most of the people here have heard about this. A politically motivated couple in Texas began to fact-check textbooks to undermine their publishers' credibility. No major publisher was spared. Some of the errors this couple found were outrageous. For example, one textbook asserted that the Korean War ended when President Harry Truman dropped the atomic bomb. Another textbook was found to have 500 errors! The *Encyclopædia Britannica* editors saw that all the errors that were being reported in the press could have been corrected simply by looking things up in *Britannica*, but the textbook publishers told us that they did not have the time or money to do proper fact-checking.

Thus was born what we originally called the *Britannica Fact-checking System* and now call the *Britannica Instant Research System*. The aim of the product is to provide a highly efficient way to look up information in *Britannica*. We have tested this product extensively. Perhaps the most interesting thing we have discovered is that electronics reduces the time and cost of fact-checking by 70%. We also tested the product against some textbooks. For example, we fact-checked the book I mentioned earlier that had 500 mistakes. We found 700. Just think what your kids are reading when they go to school!

The textbook scandal made us redefine our strategy once again. We realized that we could take the same content -- in this case the text of *Encyclopædia Britannica*--- and package it in different ways for different users. The *Instant Research System* is designed for high productivity; it is intended for people who have to look up a fact quickly and then turn to something else, or perhaps look up another fact. The system is not designed for reading long articles; for such an application, nothing beats a book.

With productivity in mind, we made some important decisions about the design of the *Britannica Instant Research System*. First, we determined that this product should be run off of a hard disk or server and not from a CD ROM drive in order to make the access time as fast as possible. Secondly, and for the same reason, we designed the product for a 486 machine running Microsoft Windows. It should be obvious to people who know their computers that these hardware requirements go far beyond what most people have at home. Which leads us to a third strategic decision. We determined that we wanted to position *Encyclopædia Britannica*, or at least this particular version of *Encyclopædia Britannica*, as a tool for professionals. This was a very big change for us, as encyclopedias are traditionally sold as homework helpers for school children. There is something amusing about an 8-year old using the *Encyclopædia Britannica* to do homework, but, of course, if your children are as bright as mine, you probably made *EB* available to them before they entered kindergarten.

Suddenly, the solitary *Encyclopædia Britannica* has three incarnations: the traditional print set, which is sold to families and libraries; *EB Online*, which is designed for campus networks; and the *Britannica Instant Research System*, which will be used by businesses for research and to fact-check documents, and by librarians to service their clients' queries. Digital media make the multiplicity of implementations possible. And more versions are in the works. For example, we are now discussing the possibility of building *Encyclopædia Britannica* into a publishing system, where it could reside with such other worthy titles as the *Chicago Manual* and *Merriam-Webster's International Dictionary*; and we have found an entirely new avenue for *Encyclopædia Britannica* in the world of

artificial intelligence, where it is being used to train neural network software. We now view every potential customer as an opportunity to reinvent *Encyclopædia Britannica*.

But in fact we are not reinventing *Britannica;* what we are doing is changing the way the information is delivered. The print version has text; *EB Online* has text: and it is the same text. The encyclopedia may be more useful in one medium than in another for certain things, but it is still the same encyclopedia. I am fortunate enough to have both print and electronic versions accessible to me, and I use both. I use the computer version for look-up and reference; I use the print version when I want to read something at length. Actually, I have three versions: I also have a copy of the 11th edition in my office, which I use solely to impress intellectual snobs who come to visit. I am, of course, being facetious, but we shouldn't forget that books can have an almost talismanic or ritualistic quality: they can be sacred objects, and they serve to sanctify the individual who can claim ownership of them.

We are not reinventing *EB*, though we are changing its medium; we are not reinventing *EB*, but we are changing its form; we are not reinventing *EB*, but we are taking it from the sacred to the profane; we are not reinventing *EB*, but in some ineluctable fashion we have changed its meaning. At what point do we say that even though we have not reinvented the encyclopedia, we have, through the accumulation of so many formal changes, done something that we may as well call reinvention?

At some point in working with digital media, the media begin to strike back. A CD ROM may at first submit quietly to having the text of a print product poured onto it, but at some point it begins to reshape that text. Suddenly, it is not the same text any more. The medium is not passive; it serves to define its content.

This is an unsettling thought. When you are dealing with an attempt to summarize the world's knowledge, as we are at Encyclopædia Britannica, the implication is that we are somehow changing knowledge itself. We would prefer not to be that ambitious. On the other hand, it may be naive for us to think that an encyclopedia, or any intellectual artifact for that matter, somehow stands outside of time. Encyclopedias and a view of knowledge are, of course, expressions of a particular era, and for the multi-volume print encyclopedia and the world view it implies, it is a bygone era. An electronic encyclopedia is both an accommodation to changing times and an artifact that will serve to change the times.

As we look down the road at future publications, we see the form of an encyclopedia becoming increasingly spatial, and by implication, our notion of knowledge is becoming increasingly spatial as well. We do not scorn chronology or alphabetization; but these ways of ordering events and ideas no longer seem so incontrovertible, so natural. We see the form of an encyclopedia becoming more and more atomistic, more and more suited to electronic search and retrieval; and we wonder what that says about knowledge itself. Formal changes beget substantive changes; in a language whose form includes no transitive verbs, no one can ever kick the bucket. We do not believe we have even begun to scratch the surface of the implications of digital media, but we do know that everything is getting curiouser and curiouser.

AAUP Gophers Invade the Internet

Chuck Creesy
Computer Administrator
Princeton University Press

It was just over a year ago, shortly before the last ARL/AAUP Symposium, that Nebraska became the first university press to put a searchable catalog of its books online. To be sure, Nebraska did not use Gopher, though it plans to switch to Gopher as soon as it can. The first Gopher-based online press catalog was created, appropriately enough, at Minnesota. Several other university presses soon followed -- taking advantage of their parent institutions' campus-wide information systems, which is a good thing to do if you can.

This past September -- such a long time ago -- Chicago became the first university press to mount its own Gopher server on the Internet. A few days later Princeton followed suit. In the beginning, we weren't ready to put our catalog online, so we built a menu pointing to all of the other academic press online catalogs. (This went through several iterations before we got it right, as can be attested by readers of the AAUP List.) Initially, our menu pointed to just the aforementioned presses plus British Columbia, Illinois, Johns Hopkins, MIT and Rutgers, but it quickly grew. Moreover, a growing number of other Gophers began pointing to our menu as a route to University Press Online Catalogs, or created their own versions of it.

Why Gopher?

Of the thirteen North American university presses that had catalogs on the Internet as of last month, eleven had chosen to use Gopher. Why? For starters, in the two years since it was developed at the University of Minnesota, Gopher has become the most popular vehicle for campus information systems across the country. As of November 1, more than 2900 public Gopher servers were at work on the Internet Because of its power and ease of operation, more and more people are using Gopher as an "Internet Browser" or tool for navigating their way through and finding information in this still largely uncharted mother of all networks. And as a practical matter, there is a pool of expertise at most universities to draw upon for assistance in setting up a Gopher-based catalog.

What makes Gopher even more useful as a research tool is the availability of Veronica search engines (the name was intended to complement a similar indexing system called Archie -- archive without the "v" -- used for locating files in FTP sites). The Veronica indexers scan the entire Gopher universe twice a month and catalog every directory and file listing. These indexes are transmitted to a half-dozen central Veronica search engines around the globe that can be accessed by any Gopher user on the Internet: A boolean search on Veronica produces a menu pointing to all the "hits" found; the user can then follow the pointers that seem most promising to their source.

Automatic Union Catalog

Consequently, all a university press has to do is construct its online catalog so that every book is listed in files containing the relevant bibliographic data and organize it so that the files are listed on menus with the authors and titles in the item descriptions. Then when the Veronica indexer makes its scan, it in effect constructs a union catalog of all participating

university presses. To take a Princeton example, if you go to any of the Veronica search engines that have indexed university press Gophers and search for "Woodrow Wilson," you will get a list of all 69 volumes of the Woodrow Wilson Papers published by Princeton, along with many other references to the 28th President. (As of this writing, six Veronica sites have picked up university press listings: PSI in California, NYSERNET in New York, University of Manchester in Britain, University of Cologne in Germany, University of Pisa in Italy, and SUNET in Sweden.)

As in the above example, Veronica searches will mix hits on university press books with many other kinds of listings. This is advantageous inasmuch as a scholar using Veronica to look for information about a certain subject can hardly avoid encountering relevant university press titles. But if one is looking only for books, the results of a Veronica search will be somewhat cluttered. This is where another search tool comes into play: it is called Jughead and, as the name implies, it is a kind of limited Veronica. Whereas Veronica searches all of Gopherspace, Jughead can be made to index and search only a predefined portion of it--such as all university press online catalogs--filtering out everything else.

AAUP Server

Thanks to the efforts of Bruce Barton at the University of Chicago Press, there is now a Jughead devoted exclusively to the AAUP universe. It can be accessed from the Chicago Press Gopher (go to the "Catalogs from Other Presses" menu) or from the Princeton University Press Gopher (go to the "Online Academic Press Catalogs" menu) or from any other Gopher server that points to either of these. Before long, we hope to have more AAUP Jughead search engines at other locations, which will increase users' chances of getting through when traffic is heavy.

Furthermore, we are very close now to establishing a central AAUP server that will provide an online catalog of all the books in print of all the member presses. The exact configuration remains to be worked out, but the idea is to create a comprehensive "union catalog" that would enable one-stop shopping as well as separate access points so that each press could have its own individual catalog on the central server. This Gopher would supply basic bibliographic data for all AAUP members with optional pointers to their own Gophers, and member presses would be able to add supplementary detail (such as catalog blurbs, tables of contents, abstracts, reviewers' quotes, etc.) and perhaps even to build more elaborate menu structures. The server would also furnish full-text indexing and search capability for such descriptive matter, and some kind of order-form mechanism.

An online catalog should not be viewed as an end in itself, but rather as a beginning: what we have here is a viable means for delivering electronic product in the future (and I use the vague word "product" because we have only the vaguest idea yet what forms of information we will be delivering). This delivery mechanism will become more sophisticated and will offer more features -- including a secure means for billing to credit card numbers. And to judge from the current scramble of cable operators, telephone companies, and media giants, it will not be long before we can deliver efficiently to home as well as office.

A Peek Under the Hood

For those who are new to this technology, it might be helpful here to elaborate a bit about what is actually going on when one Gopher points to another. The key to Gopher's client/server architecture is that the server does not have to "hold state" for its clients, which minimizes both the amount of computing power and the amount of network bandwidth required. That is, when a user (client) calls up or follows a pointer to a Gopher host (server), it in effect sends a single message (called a selector, a request to have something sent back). The server responds by sending back the requested item (typically a file or a menu of pointers to other items) and closes the connection. The user can then think as long as he wants before sending his next request, for he is not putting any load on any server or any traffic on any cable.

The client software retains each menu as the user picks his way through the tree of directories. Behind each item description that

he sees on his display screen is the associated pointer. It consists of a numerical code indicating the type of item listed (0 for file, 1 for directory, etc.), the text describing the item, the path to the drive and directory where the item is stored, the address of the host server, and the port on that machine to which the connection must be made. When the user chooses the item he wants, typically by clicking it with a mouse, a signal is sent to the associated host server, via the designated port, transmitting the desired selector. It's almost that simple.

The elegance lies in the combination of ease of navigation and the economy of demand on network as well as local machine resources. Mark P. McCahill, the Gopher project leader at Minnesota, has dubbed it variously "Internet Duct Tape" and "the Finger protocol on steroids." The beauty derives also from its flexibility: at the server end, one can build any structure of menus pointing to resources and directories of files for reading or downloading. If the information you want to make available in your online catalog already exists in a database, it should be possible to write routines that will automatically generate both the menus and the text files. (We did this at Princeton using FoxPro and we have posted an annotated version of the code in a "Developer's Toolbox" on our Gopher for anyone who is interested.)

Putting Together Tinker Toys

UNIX Gopher servers create menus by reading the designated directories and then adding in other pointers and more elaborate item descriptions as indicated in associated "link" and "cap" files. The Macintosh Gopher server makes the process of building menus even more transparent: you just go out and grab bookmarks and drop them into your menu structures (defined by file folders) as desired. This amounts to assembling what McCahill has described as an "Internet Convenience Store" (he also says, "If you build a good organization, they will come.") Looking at it from the other side, you can put together menus of selected Internet resources in whatever pattern is most convenient for your staff to access them.

You do not need a big machine to mount a Gopher server, though you do need to have a direct connection to the Internet. Some of Minnesota's top level servers run on old Mac IIsi (25 Mhz) boxes; in the PC realm, a 386 machine is adequate (in both cases, you want to pop in as much memory as you can afford). If you don't have a computer specialist on your staff, you probably will need some technical help but, as noted above, that should be available at most universities these days. Indeed, you may want to leave all the technical details to your university's computer service department and just specify the menu structure you want and provide the data files. Most university press Gophers are installed on machines being run and maintained by their parent institutions.

While you can get by with a Mac or a PC, if you are at all ambitious about your Gopher, you will want to run it on UNIX, because that is where the primary development effort is being made and that is where the most tools are. You can run Apple's UNIX (known as A/UX) on a Mac, and there are several UNIX options for 486 machines, such as Linux (which is free) or NextStep. Client and server software and documentation for UNIX and native Macintosh are available through boombox.micro.umn.edu.

GopherPlus

A second-generation protocol, called GopherPlus, has recently been implemented to varying degrees in different clients and servers for the various platforms (principally UNIX, Mac, PC, and VMS). Among the new features it offers is a facility enabling users to fill out order forms and leave them posted at the host server--an addition of obvious utility for university press online catalogs. Other improvements over the first generation include:

- retrieval of more kinds of non-text items, including many graphics formats
- alternative representations (or VIEWS) of a document, besides plain text, such as postscript or word-processor-specific formats, or even foreign-language translations

- multiple attributes associated with an item (name of administrator, time of last modification, abstract of contents, etc.)
- more efficient binary transfer
- ability for client to send data to server
- server-defined forms (to be filled in by client user)
- better error reporting and handling
- easier indexing capabilities
- a place for authentication techniques (still under development)

The UNIX GopherPlus server, which is now up to version 2.10, supports full-text search (WAIS or NeXT) and an integrated gateway to WAIS and FTP. It comes with a Perl script called go4gw that will automatically connect to Archie, USENET, Finger/Whois, Webster, Netfind, and other services. It is also capable of fanning out parallel searches to more than one server.

University Presses Innovate With Internet Book Catalogs

Nancy Duxbury
Canadian Centre for Studies in Publishing, Simon Fraser University
and University of British Columbia Press

Why Catalogs on the Internet?

Much more than a marketing tool, an online catalog is a press's main presence on the Internet and the hub of its electronic communication. It promotes both a press's books and the press itself, and promises a range of benefits to the press and its customers. The descriptive information placed in an online catalog can be more substantial and more useful than that in print catalogs and brochures, promising improved title marketing, according to Kathleen Ketterman, marketing manager of Indiana University Press, and Peter Milroy, director of UBC Press. Lisa Freeman, director of the University of Minnesota Press, says that an online catalog can make the press's interest in e-issues known to gopher developers and others on computer networks (including librarians), introduce the Internet and gopher technology to press staff, be used as an in-house reference tool, diminish demands on customer service staff, and, ideally, generate sales.

Showing the university community that university presses are "hip to the e-world" is important. This perception makes an online catalog an important acquisitions tool. Online catalogs encourage active press participation on the Internet, and are key to further electronic network projects. Already, some presses offer book chapters, journal article abstracts, and digitized images through their catalogs.

At this time, fifteen university presses have established online catalogs:

Edinburgh University
Johns Hopkins University Press (JHUP)
Harvard Business School
Harvard University Press
Lehigh University Press
MIT Press
Princeton University Press
Rutgers University Press
SUNY Press
University of Arizona Press
University of British Columbia Press
University of Chicago Press
University of Illinois Press
University of Minnesota Press
University of Nebraska Press

As well, several commercial publishers have online catalogs, including Addison-Wesley, Meckler Publishing Company, O'Reilly & Associates, and Prentice-Hall.

How does one find them?

Online catalogs are accessed via a telnet command or a gopher menu. Telnet access requires the user to know the exact computer address of the catalog. Gopher access only requires the user to know the university's name and geographical location, although some presses are buried under multiple menus and/or located in categories not always intuitive to the user.

What does the catalog teach about the press?

Online catalogs typically offer information about the press itself, books and journals published, and ordering information. Press information, such as mailing addresses, phone numbers, e-mail addresses, contact names, and brief descriptions of editorial programs are available, although the amount of information available varies. UBC also offers detailed information directed at potential authors, including a description of the university press publishing process and format guidelines for submitting manuscripts and electronic files.

What book information is offered?

Most online catalogs contain all books in print, although MIT and Harvard list only recent titles (1992-3). Book information is most commonly organized by subject, with titles listed alphabetically either by author or title within each category. As well, many contain a category for "recently published" books. Catalogs either have individual files for each title or list a number of titles in a file, which the user browses through until the searched-for title is found.

All catalogs contain basic information such as the names of authors, full book title, ISBN numbers, sales restrictions if any, number of pages, format (paperback/cloth), price, and perhaps details about the type and quantity of illustrations. Most presses offer a description or summary of each title as well. Author profiles, review quotes, and tables of contents are available in some catalogs.

What journal information is offered?

Only MIT and JHU Presses mention journals in their online catalogs, and offer basic information such as title, editor, frequency of publication, a short descriptive blurb, addresses, and ordering information. JHUP also offers the table of contents and abstracts of articles via gopher and FTP prior to publication.

How does one order press publications on the Internet?

All presses offer basic ordering information and note means of access to the press, such as phone, fax, e-mail, and regular mail. UBC, Minnesota, MIT, and ORA accept orders via e-mail. In lieu of an e-mail ordering system, JHUP and Harvard offer an electronic ordering form which can be printed out and mailed or faxed to them. UBC offers an order form which can be e-mailed to the press.

Locations of online catalogs

On September 19th, Chuck Creesy of the Princeton University Press linked all the press catalogs above through a menu on the Princeton gopher, and Bruce Barton of the University of Chicago Press shortly followed suit.

prompt> gopher.pupress.princeton.edu
prompt> gopher-press.uchicago.edu

Other gopher sites that take readers to the university press catalogs are:

prompt>gopher ccat.sas.upenn.edu (University of Pennsylvania Center For Computer Analysis of Texts); prompt>gopher gopher.lib.virginia.edu (University of Virginia Library); and prompt>gopher gopher.usask.ca (University of Saskatchewan Library).

In October, Bruce Barton also assembled the first Jughead index for all university press gophers, making the records searchable by words and combinations of words. The Jughead is available through both Chicago and Princeton.

Nancy Duxbury UBC Press/Canadian Centre for Studies in Publishing, Simon Fraser University (duxbury@sfu.ca Duxbury) has spent the 1993 summer semester in an internship at UBC press developing an online catalog and completing her Master of Publishing Degree from Simon Fraser University. She is beginning a Ph.D. in Communication at SFU this fall.

National Museum of American Art
New Media Initiatives Project

Steve Dietz
Project Director
National Museum of American Art

The National museum of American Art (NMAA) is distributing text and images and providing online services via the commercial network American Online as part of a larger outreach via the "information highway."

As part of its broad mandate for the "increase and diffusion of knowledge," one component of NMAA's national outreach effort is the delivery of published texts, digital images of art objects in the collection, and reference services/two-way communication into homes and offices around the country via the wide area network, America Online. We view the commercial/consumer nature of the network to be not dissimilar to the trade titles of a university press list sold through chain bookstores. Our AOL outreach efforts will be complemented by similar efforts on the Internet, with on-site kiosks and CD-ROM products, alongside traditional print publishing.

NMAA Online is a subset of Smithsonian Online and is the only museum participating as a whole in SI Online. NMAA provides resources in six areas. The main NMAA Online screen has color icon-based access to the following areas (See screen shots and figures that correspond to most of these areas):

"Welcome to NMAA" provides general information about the museum, including current exhibits, the museum's mission statement, and press releases and digitized press photos. **(Figure 1)**

"Tour the Galleries" is a library of over 100 downloadable digitized images of artworks in the collection. The library is subdivided into content areas such as "NMAA Collection Highlights" or "American Landscapes." Each image is presented at screen resolution (72 ppi) in 256 colors (8 bit, custom palette) and includes a copyright notice within the image itself. At the present time, these images cannot be viewed interactively and must be downloaded (approximately 8-20 minutes at 2400 baud) onto the users' hard drive. "Thumbnail catalogs" that only take 2-4 minutes to download up to 16 images are also available in a reduced 16-color palette for previewing the images. Each image is in a GIF format, which can be read on either Mac or DOS/Windows platforms with an appropriate GIF viewer. Each image includes a full caption and extensive descriptive text as part of the download. **(Figure 2)**

"Reference & Online Help" provides information about library and other database resources at NMAA. It is also used extensively for its online reference help, with a wide variety of questions being asked on a daily basis. This is one of the most used resources of NMAA Online. **(Figure 3)**

"Publications" includes the complete text of *Free Within Ourselves: African-American Artists in the Collection of the National Museum of American Art*, by Regenia Perry, excerpted articles from our scholarly journal *American Art* (no images), the texts of various brochures and other published material, and a complete publications backlist catalog that people can order from. **(Figure 4)**

"With Kids in Mind" reproduces various educational materials and can be used by teachers to help plan class visits to the museum. **(Figure 5)**

"Art Talk" is our interactive area and includes a bulletin board for open discussion of museum-related topics with over 450 postings on more than 30 topics. There is also a weekly art quiz, an area to upload digitized versions of personal

artwork for review by a curator, and a live chat area is planned for real time interaction with curators, artists, authors, and other experts. **(Figure 6)**

Results: NMAA Online became available at the end of September 1993. In the first three months, there have been over 10,000 downloads of NMAA GIFs (image files) and viewers have made approximately 40,457 "entries" into the NMAA Online area, spending approximately 2,700 hours there. We are very encouraged by these results and view WANs as an important new way to "publish" information and make it easily available to anyone in the country with a computer, a modem, and a phone line.

Figure 1

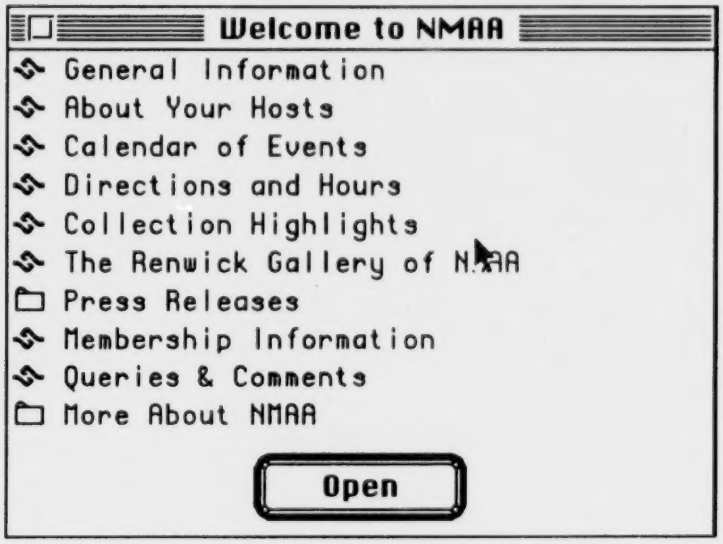


Figure 2

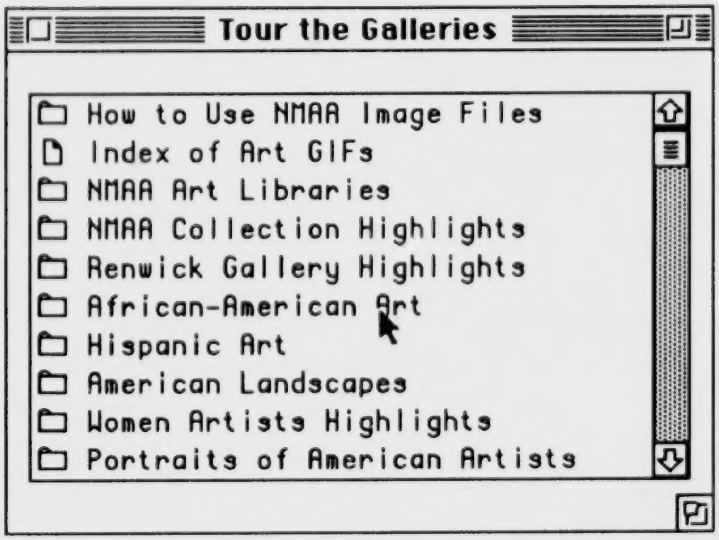


Figure 3

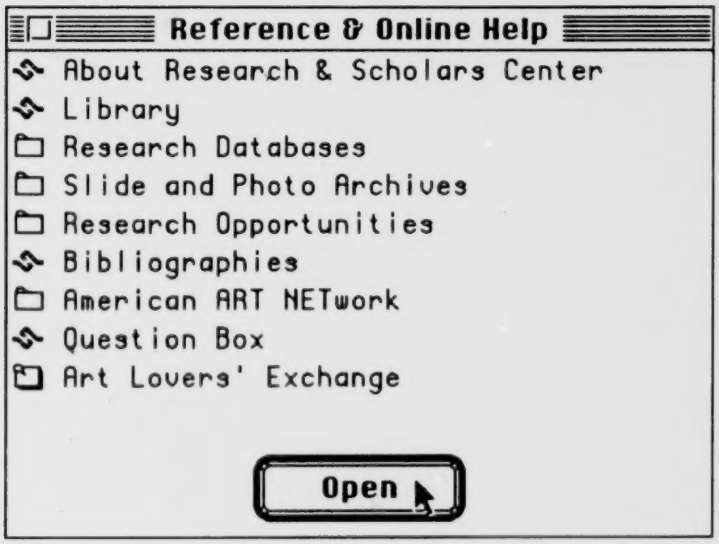


Figure 4

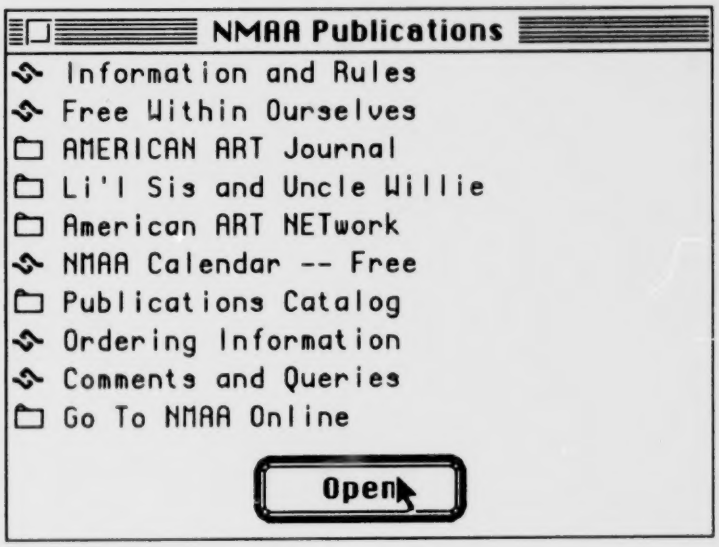
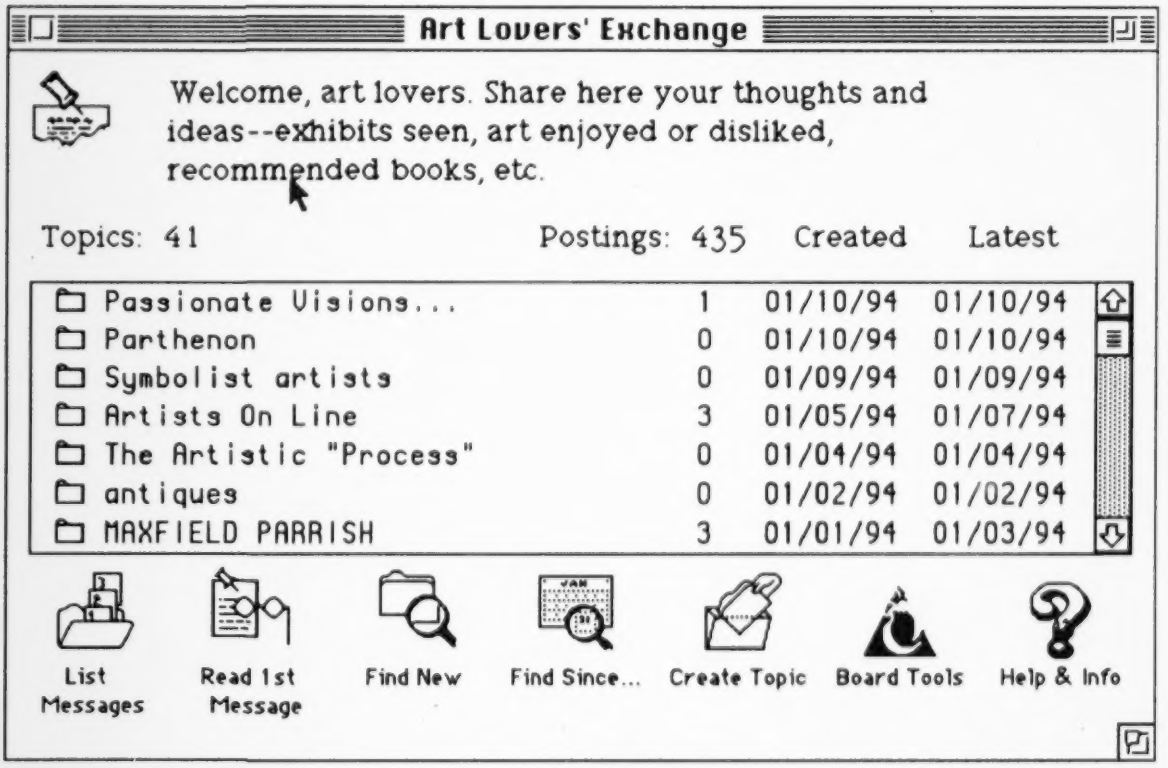


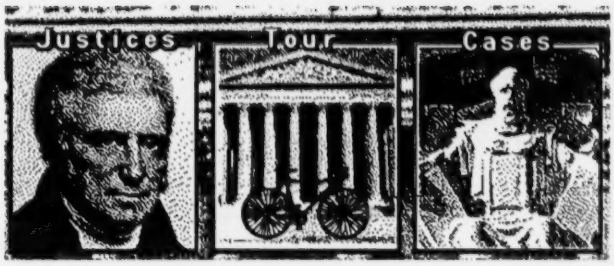
Figure 5

Figure 6



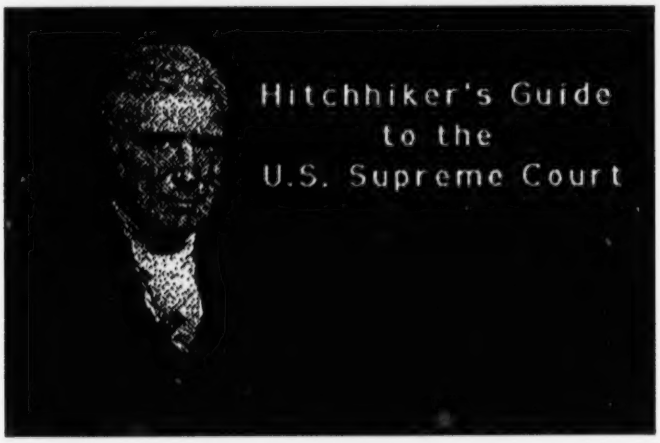
The Hitchhiker's Guide to the U.S. Supreme Court

Jerry Goldman
Political Science Department
Northwestern University



The Hitchhiker's Guide to the U.S. Supreme Court (© 1993 Jerry Goldman) is a multimedia resource designed to provide novices and experts with information about the Supreme Court, the justices, and the constitutional decisions they render. The Hitchhiker's Guide uses text, images, video, and sound to convey this information. **(Figure 1)**

Figure 1



The Guide is a set of HyperCard stacks offering users background information on all 107 justices (biographies, portraits, decisions, years of service, etc.). Justice information may be accessed through a unique time-driven search engine or by a simple alphabetical list. The justices may be searched through their "seats," traversing the stack via predecessors and successors. **(Figure 2)** Many of the justices had an impact on constitutional law. The justice cards link to summaries of their significant constitutional opinions. **(Figure 3)** At the moment, the Guide contains over 700 such

Figure 2

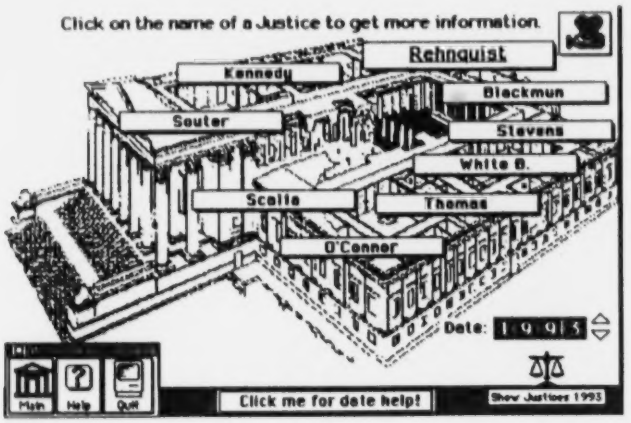
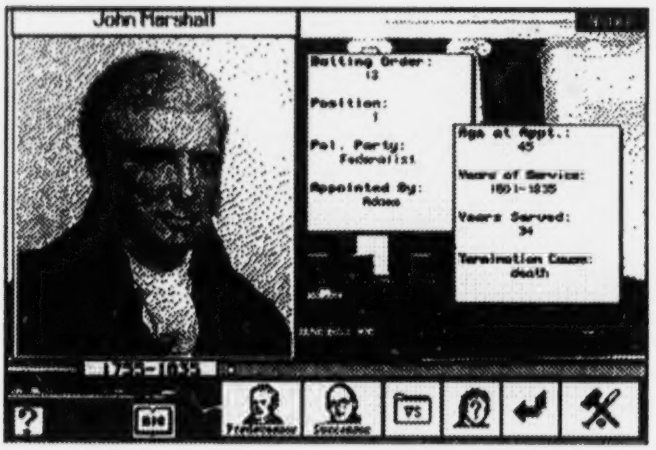


Figure 3



summaries. These cases represent all the constitutional opinions found in the leading constitutional law textbooks used in political science and law courses. Each summary (or brief) provides a statement of the facts, the constitutional question presented, the conclusion reached by the Court, and the vote of the justices. It is possible to access case summaries from the justice "cards" and it is possible to access the justice "cards" from the case

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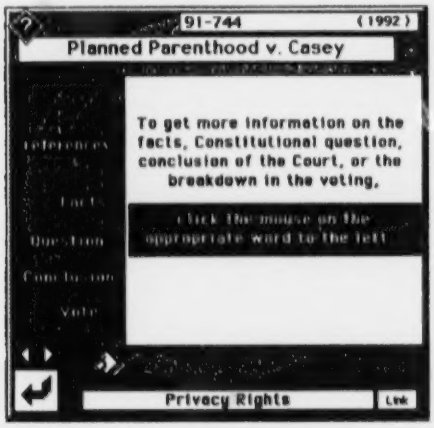
summaries. The cases are grouped by subject matter, but they can also be viewed chronologically or alphabetically. **(Figure 4)**

Figure 4

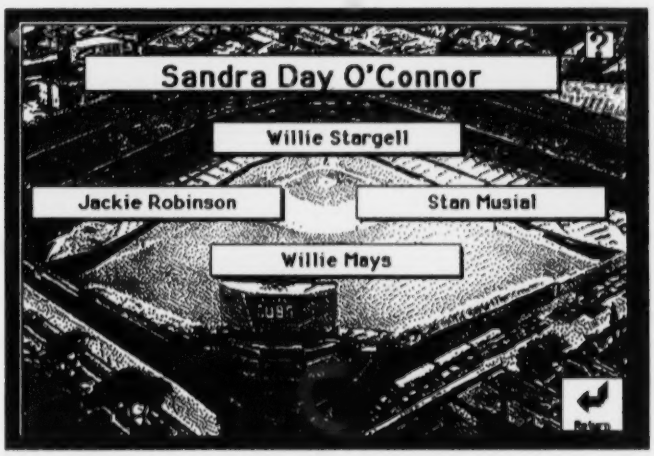

91-744
(1992)
Planned Parenthood v. Casey
To get more information on the facts, Constitutional question, conclusion of the Court, or the breakdown in the voting,
Privacy Rights
Link

I am now working on some enhancements to make the Guide more useful. Each case will be linked to the full text of the Court's opinions. As users delve deeper into the stack, they will come to the actual words and arguments of the justices to illuminate the meaning of the Constitution. I have started to include selections from oral argument in key cases decided in the last 30 years. These sound clips give users a sense of the personalities and issues of constitutional adjudication (see, e.g., *Ward v. Rock Against Racism*, *Griswold v. Connecticut*). I have enhanced the justice biographies with video clips of recent confirmation hearings for Justices Thomas and Ginsburg and plan to do do the same for Justices Rehnquist, Scalia, Souter, and Kennedy.

This summer, I added a QuickTime movie of the exterior and interior of the Supreme Court Building. With the cooperation of the Curator's Office, I have made a video of the courtroom and the conference room, as well as other locations inside and outside the building. I shall continue to edit and digitize these images to make the tour user-friendly and comprehensive.

The Guide is built on a baseball metaphor. **(Figure 5)** Although it is not central to its use,

Figure 5



the stack contains something called the "Law-Baseball Quiz." The Quiz originated with the late Robert Cover of Yale Law School. I have extended his vision to a large subset of the justices. The user might well find that "Play ball!" and "May it please the Court" have much in common.

In its full version, *The Guide* will be distributed on CD-ROM, which is a cheap and stable medium. At the moment, the most likely targets for this work are libraries, departments, and media centers. However, the market for CD-ROM is expanding quickly. This year, there should be 4 million individuals with CD-ROM drives. By 1995, the number should surge to 15 million. Students enrolled in constitutional law (about 75,000 a year) would find *The Guide* helpful. Faculty would also find it handy for reference purposes and for classroom use.

For more information on ***The Hitchhiker's Guide to the U.S. Supreme Court,*** contact:

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Project Muse

Susan Lewis
Journals Administrative Manager
The Johns Hopkins University Press

In September 1993, the Johns Hopkins University Press, the Milton S. Eisenhower Library, and Homewood Academic Computing joined forces to launch Project Muse, an effort that will enable networked electronic access to the Press's scholarly journals.

The goals of Project Muse are to make the journals of the Johns Hopkins University Press available to students and researchers from their networked desktop computers; create an e-journal environment that is powerful, elegant, and easy to use; and determine amount and types of usage for an access and costing model.

The first phase of the project will be a pilot demonstration consisting of current issues of *Configurations*, *MLN* (*Modern Language Notes*), and *ELH* (*English Literary History*). In February of 1994, the fully formatted text of these journals will be available to the JHU community via online access to the library's server. Features include subject, title, and author indexes, as well as instant links to tables of contents and endnotes. Users will also be able to add voice and textual annotations and download PostScript files for printing.

A public unveiling of Project Muse will be held on February 15, 1994, in the electronic classroom of the Milton S. Eisenhower Library. After sufficient data have been gathered from the demonstration project, the JHU team will mount all forty-two of the Press's journals in math, the humanities, and the social sciences. These issues will appear on a prepublication basis and will be available electronically a few weeks in advance of the printed version.

Project Muse is being created with Mosaic client/server software developed by the National Center for Supercomputing Applications. Client software is available for the Unix, Windows, and Macintosh operating environments, allowing networked users to access the journals with a variety of operating systems.

Mosaic software is designed to display text that has been tagged or coded, in HTML (HyperText MarkupLanguage). These codes enable the creator to embedhidden commands in the text for both display and "links" to other parts of the document, as well as to outside text, graphics, sound, video, etc., regardless of where these items are located on the network. To save time and labor, the team is using a unique process for text markup. This process entails running a program that automatically translates PostScript files to HTML-tagged files.

For further information, contact Todd Kelley, Eisenhower Library (kelley@jhunix.hcf.jhu.edu), or Susan Lewis, The Johns Hopkins University Press (suelewis@jhuvm.hcf.jhu.edu).

[ED. Note: the Project Muse presentation at the Symposium was made by Scott Bennett, R. Champlain and Debbie Sheridan Director, Milton S. Eisenhower Library, The Johns Hopkins University.]

Welcome to Project JANUS
The Columbia Law School Digital Library

Kent McKeever
Associate Law Librarian
Columbia University Law Library

What is Project JANUS?

Project JANUS is a five-year prototype digital library which utilizes the power of a massively parallel supercomputer to provide users with access to texts, images, sound and video from remote and local workstations, through advanced, user-friendly search and retrieval software. Project JANUS began in 1990 in response to a request by the Columbia Board of Trustees for the Law Library to evaluate alternative modes of library access which utilized new technologies in lieu of physical expansion of library space. Research by Law Librarian James Hoover and then Director of Computer Systems and Research Willem Scholten led them to the ideas of coupling massively parallel supercomputing, state of the art imaging, WAIS (Wide Area Information Servers) and free text searching to build a "virtual library" -- the library of the future.

In November of 1992, a Connection Machine 2 supercomputer, on loan from Thinking Machines, was installed in the Columbia Law Library for Project JANUS, making Columbia Law Library the first library to install a supercomputer.

JANUS allows users to search for words, phrases or whole paragraphs in multi-gigabyte databases. Integration of new imaging technology offers a valuable tool for archival preservation, and the powerful search engine offers users full access to text contained in images. As the JANUS project is developed users will be able to have access to tens of thousands of books, both archival and current copyrighted editions. In addition, JANUS is a means of preservation and enhanced access to significant archival collections such as the Perlin Papers (the Rosenberg/Sobell FBI Surveillance Archive) and the Nuremburg Trial Papers.

Columbia is partnered with Future InfoSystems, Inc., a new research and development company started by Willem Scholten, the former Director of Computer Systems and Research for the Law School, to continue work on expanding and developing Project JANUS. In the future, the JANUS digital library will offer access for thousands of concurrent users, searching terabytes of data, using both Boolean and natural language searching, and retrieving sound, image and full motion video.

History

Future Info Systems, Inc. grew out of a collaboration between Thinking Machines Corporation, of Cambridge, MA, and Columbia Law School, in New York City, to develop a digital library utilizing massively parallel supercomputer power. The digital library, entitled Project JANUS, incorporates image, sound and full text retrieval. A prototype of the system is currently running on a locally installed Thinking Machines CM-2 supercomputer in the Columbia Law Library.

FIS is partnered with Thinking Machines Corporation to develop next-generation text retrieval software, which builds upon years of Thinking Machines Corp. research in text retrieval utilizing Massively Parallel Processor machines.

Product Descriptions

FIS is developing a scalable full text retrieval system to run on platforms such as the Thinking Machine Corporation Connection Machine massively parallel supercomputers, other MPP

supercomputers, and which is also scalable down to single processor Unix SPARC-10 workstations. The FIS retrieval engine incorporates retrieval with both Boolean and natural language queries, with a special feature, called "best-chunk" return, which positions the document viewer at the section of the document which most closely fits the query. The engine also supports full relevance feedback.

A unique aspect of FIS's new retrieval engine is its use of imaging technology. The server provides full text searching of bit-mapped images of documents, using Optical Character Recognition technology, which offers a revolutionary means of storing and accessing large numbers of documents only available in paper format.

FIS also offers a new retrieval client featuring communications interoperability, with full Z39.50 1993 compliance. The client will also provide options for gateways to other services, full image manipulation options, Boolean and natural language support, and relevance feedback on digital images of text.

Interoperability and Scalability

Future InfoSystems, Inc. realizes the importance of flexibility in communication across networks, and therefore is working to broaden choices for cross-system communication and data sharing. Use of the Z39.50 communications protocol assures backward compatibility with existing information servers like WAIS, as well as future systems.

Another important aspect of the FIS system is its scalability and its ability to grow as database sizes increase. Utilization of the Thinking Machine's CM-5 supercomputers assures a virtually unlimited growth potential.

Imaging Valuable Archives

The revolutionary use of pairing imaging technology with full text searching, allows a library to preserve access to the document in its original format, with censor marks and all accompanying notations, while providing a much more flexible means of access for users. In the case of the Rosenberg/Sobell Trial Archives, for which there is no finding aid to the collection, providing full text searching is an invaluable tool for researchers.

A Short History of the Perlin Papers

The Perlin Papers were given to Columbia Law Library in 1990, by Marshall Perlin, Law '42, the lawyer for the sons of Julius and Ethel Rosenberg, Roger and Michael Meeropol. The papers, which required years of work for Perlin to obtain, were given to Columbia to assure their continued accessibility. The collection contains approximately 250,000 pages, many of which are FBI surveillance records of the Rosenbergs and others under government investigation at the time. Many of the pages are sixth generation photocopies.

The Perlin papers represent the second JAMUS experimental imaging project, and one with the most exciting results so far. The pages are saved as digital images, using a scanner. Then a process which "recognizes" the text in the image, called "Optical Character Recognition" is performed on the pages. the database is built using both the ASCII text file created in recognition and the high-quality page image. The advantage of the JANUS system for collections like the Perlin Papers is apparent immediately. Because the system displays high quality images rather than only the text, censor marks and marginal notes are preserved. In addition, when the Perlin Papers are available fully on-line, they will by accessible by far more people than when they were solely in paper form.

JANUS will first serve scholars on Columbia's campus. Later, when it is fully operational, it will be accessible from any remote computer using a WAIS server, and via Internet it will be able to serve users nationally and internationally. Development of a large bandwidth network channel, such as proposed for the NREN and NII, would allow a large number of users to browse and work in the Columbia Law Library from any connection. JANUS is working to establish relations with publishers to allow for use of copyrighted materials in electronic form and plans to develop programs to track and verify use of licensed materials electronically. The

Columbia Law Library contains the nation's third largest collection of legal materials.

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Britannica Instant Research System - BIRS

Douglas Paul
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The Britannica Instant Research System is the first electronic product based on the complete text of the *Encyclopaedia Britannica*. Designed for use by professional researchers, fact checkers and librarians, it combines the long-trusted authority and scope of the *Encyclopaedia Britannica* with natural language, high speed search and retrieval. Not presented as a multimedia encyclopedia (it is a text-only system), we believe it is more usefully compared to online databases.

How it Works

The main screen, called Idea Search, has a series of windows. The user inputs a query into the Query Window. The query may be a word, several words, a phrase, or an actual question (Why is the sky blue?). Another window shows the three databases that can be searched: The *Macropaedia, Micropaedia* and *Britannica Book of the Year* (current edition). These can be selected singly or in any combination by clicking on each one.

After typing in a query, the user presses Enter or clicks on "Go." The window at the bottom of the screen then returns a list of article titles, ranked by relevance to the query (with the most relevant presumed to be at or near the top of the list). The first title is automatically highlighted by the system, and the beginning text of that article, or segment of an article, appears in the top right-hand window. With a click on "Zoom" the text window may be opened so that the text fills the entire screen. Throughout the texts, the key words of the query are highlighted in red so that the user may quickly scan through the text and identify those portions relevant to the query.

Developed by Britannica's technical group, the propriety search software uses natural language querying; users are not required to learn any new command language or protocols. The software coupled with access directly from a hard disk (as opposed to a much slower CD-ROM drive) result in search speeds that are close to instantaneous. Researchers, fact checkers and librarians who have previewed the system are unanimous in their relief that the "great EBB" now provides a means by which searches may be performed speedily and with little training required. Intended to provide significant productivity savings to publishers, BIRS has proved in beta test sites to improve productivity by as much as 75%.

Other Features

The Britannica Instant Research System includes a Merriam Webster dictionary and thesaurus; double-clicking on any word in the article text takes the user immediately to the dictionary definition or thesaurus entry, depending on which the user has selected as the default.

In addition to the Idea Search screen, a user may go directly to title list screens for each database and select titles directly for text display.

A new tool called People, Places and Things allows users to retrieve title lists sorted in various ways.

An electronic desktop feature allows quick navigation between screens and also permits the user to save articles on the desktop for future reference.

The System supports the usual Windows features, including the ability to save articles to a notebook (or to disk) and to print out texts.

What types of questions might be asked? During the demonstration at the Symposium,

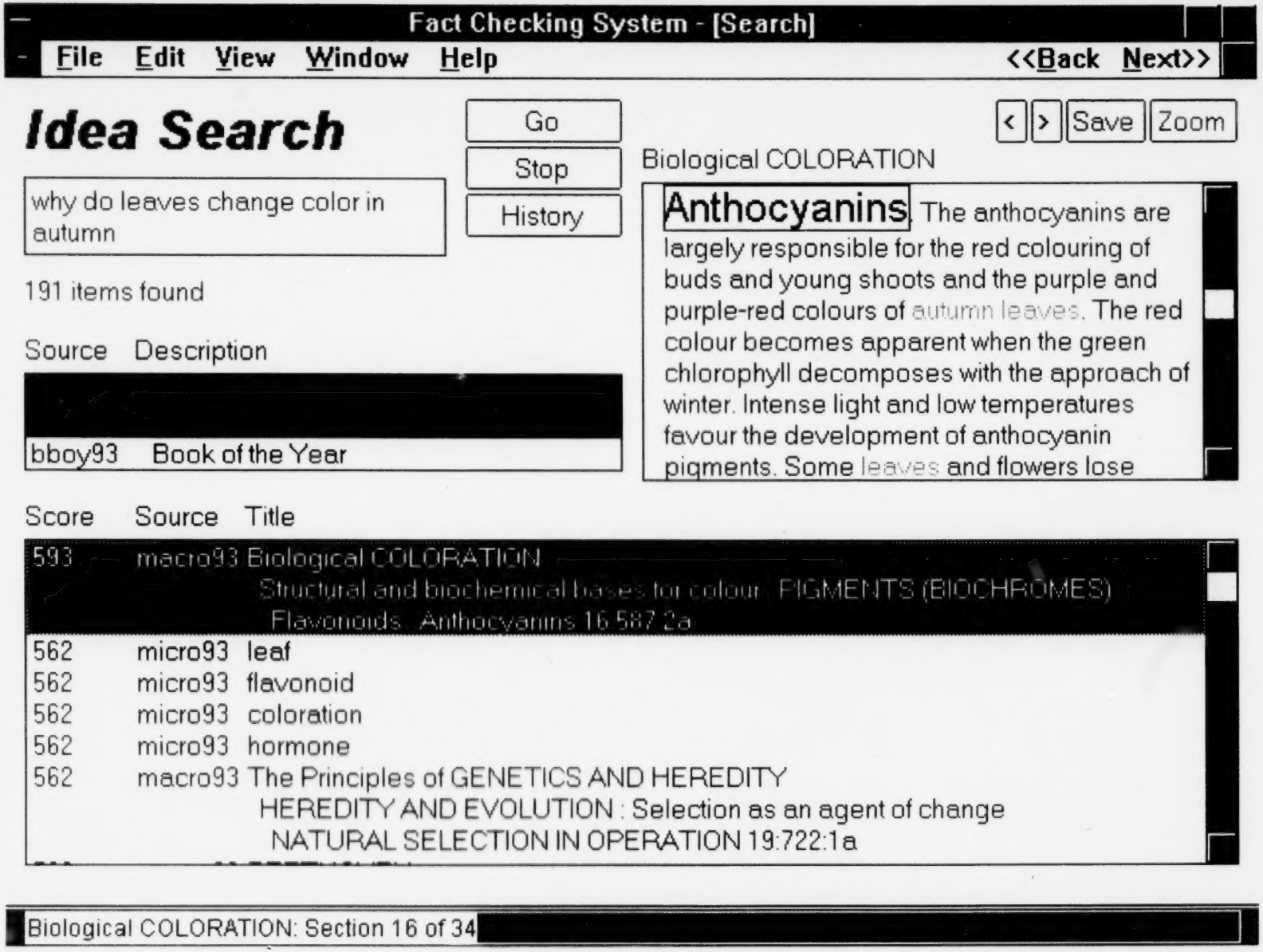
we asked, "What is the origin of the library?" We were pleased to have the first title on the relevance-ranked list direct us to an article referencing the ancient library at Alexandria. We asked, "What is Chaucer's date of birth?" and the box in the upper right portion of the screen displayed the type of authoritative information we would expect from *Encyclopaedia Britannica*. Testing the ability of the search engine to deal with searches that would be impossible in a traditional index, we typed in "Churchill, Roosevelt, Stalin" and found articles mentioning all three individuals. Scrolling the list of relevance-ranked articles, we saw the words Yalta Conference as one of the titles, and clicked on that to instantly retrieve the text of that article. (The accompanying sample screen, using the query, "Why do leaves change color in autumn?" depicts the interface used in the Instant Research System.)

Someone could well ask if the Britannica Instant Research System is an electronic replacement of the print set of Encyclopaedia Britannica. The answer is NO!! It does not contain the graphics. It does not lend itself to browsing or reading in an easy chair. It is literally a different product with a distinct purpose and set of features. Its advantage is in its instant research capacity.

Why was it developed and for whom? Several years ago, a number of textbook publishers were taken to court and heavily fined over the number of errors identified in some of their textbooks. It became obvious to our editorial staff that nearly all of the errors could have been prevented had *Encyclopaedia Britannica* been used to check the facts in advance of publishing. It was also obvious that the electronic format provided powerful advantages in this regard. The product was tested for a year with a company that provides fact checking services to publishing companies and was evaluated as quadrupling the productivity over existing services. Thus the product was designed for the professional marketplace. As academic and public librarians became aware of the product in its beta stage, they expressed interest in it and we began to see broader applicability for the research system.

BIRS runs under Windows 3.1; the recommended hardware configuration is a 486 PC or compatible, 4 MB RAM, 25 Mhz or better, with a VGA or SVGA monitor and a 1.0 GB hard disk (internal or external), a CD-ROM drive, and a mouse. The system is delivered on two CD-ROMs that are then downloaded by the user to the large hard disk. One disk remains in the CD-ROM player during the system's operation as a copy-protection device.

Even the most serious of researchers cannot help but smile at the instantaneous response to very pedantic questions.


Fact Checking System - [Search]
File Edit View Window Help
<<Back Next>>
Idea Search
Go
Stop
History
why do leaves change color in autumn
191 items found
Source Description
bboy93 Book of the Year
< > Save Zoom
Biological COLORATION
Anthocyanins The anthocyanins are largely responsible for the red colouring of buds and young shoots and the purple and purple-red colours of autumn leaves. The red colour becomes apparent when the green chlorophyll decomposes with the approach of winter. Intense light and low temperatures favour the development of anthocyanin pigments. Some leaves and flowers lose
Score Source Title
593 macro93 Biological COLORATION
Structural and biochemical bases for colour PIGMENTS (BIOCHROMES)
Flavonoids Anthocyanins 16 587 2a
562 micro93 leaf
562 micro93 flavonoid
562 micro93 coloration
562 micro93 hormone
562 macro93 The Principles of GENETICS AND HEREDITY
HEREDITY AND EVOLUTION : Selection as an agent of change
NATURAL SELECTION IN OPERATION 19:722:1a
Biological COLORATION: Section 16 of 34

Networked Multimedia Database Documenting North Carolina Between the Two World Wars

David Perry, Project Coordinator
University of North Carolina Press

As part of the American South Multimedia Database Project at the University of North Carolina, Chapel Hill, the University of North Carolina Press is proposing to construct a multimedia database of material from some of our reference works on North Carolina. The pilot project is a database entitled *North Carolina between the Wars* that would incorporate material from the period between the two world wars. *North Carolina between the Wars* will draw on a rich collection of material from our list and elsewhere, including:

H. G. Jones, *North Carolina Illustrated* (an illustrated history of the state, with some 1100 images in all), approx. 17 pages of text and as many as 150-75 images and captions, supplemented by other images from the North Carolina Collection and North Carolina Archives and History.

Tom Parramore, *Express Lanes and Country Roads* (a volume in the series *The Way We Lived in North Carolina*, published in association with the North Carolina Division of Archives and History), useful for its focus on social history and its links to state historic sites.

William S. Powell, *North Carolina Through Four Centuries* (the standard college-level history text), approx. 65 text pages.

William S. Powell, *Dictionary of North Carolina Biography* (a six-volume work with biographical sketches of some 4,000 North Carolinians), 75-100 selected sketches.

William S. Powell, *North Carolina Handbook* (forthcoming, a sort of Encyclopedia of North Carolina history and culture), topical essays on cultural features (book in manuscript form currently, not yet edited, but Powell has offered to allow inclusion of appropriate essays where desirable).

The WPA Guide to North Carolina (published in 1939 and still regarded as one of the best guides to the state), supplemental material where appropriate and other material from the WPA Writers Project.

Sound--music and spoken work from Southern Historical Collection and North Carolina Archives (Charlie Poole, blues, mountain music, worker songs, chanties, jazz, speeches, plays, prose readings, sermons, etc.).

Through the efforts of such agencies as the Farm Service Administration and the Writers Program of the WPA, the interwar period is one of the best-documented in our history. *North Carolina between the Wars* will draw on an extraordinary selection of photographs, life histories, and other documentary materials to supplement the historical narratives.

In the multimedia environment, users will be able to browse through the database using several different searching and linking strategies and read, see and hear related items. The database will be networked and made available through remote hookups to schools, colleges, libraries and individuals throughout the state (and elsewhere). Teachers and

instructors could use the database to prepare class presentations, and advanced students could use it to explore topics and create research reports or their own presentations.

The Press will receive the necessary hardware (as well as the requisite training and guidance) to compile the database and support for digitizing and cataloging text, images, and sound from a university agency interested in developing classroom applications of electronic materials. The Press will be involved in identifying and editing the materials to be included in the database and building some of the links. The database will be mounted on a univesity computer, and the responsibility for user testing, maintenance, and technical support will be shared between the press and university.

Permission will be sought for the use of all materials the Press does not control. At least during this pilot phase we plan to make the database freely available through network access, while retaining the protections of copyright in the works used.

To help identify material to be included and to advise us on content, we are establishing an advisory committee of historians, archivists, and potential users.

Simple WAIS searches through the data will yield lists of all the places a given word or name appears, and the material identified could then be displayed. The capabilities of the World Wide Web (Mosaic) technology offer other possibilities for accessing the data. For example, the H. G. Jones text (from *North Carolina Illustrated*), which provides a concise running narrative of the state's history, could be read as a "base text." It is already keyed to many of the images that would be included, which the user could display as he or she encounters related topics in the text. Following hypertext links, the user could call up topical essays drawn from the Powell history (*North Carolina Through Four Centuries*), the *WPA guide*, or the Parramore book (*Express Lanes to Country Roads*) which take up in greater depth the subjects introduced by Jones in *Biographies from the Dictionary of North*.

Carolina biographies of persons named in the narrative or the "essays" could be called up for additional information. Special icons would notify users of the availability of accompanying audio pieces.

The Press's hope is that the pilot project can become part of a larger electronic project that is currently under discussion. This larger database, initially named the *North Carolina Bookshelf*, would incorporate complete versions of several of the works being tapped for the initial project: notably the *Dictionary of North Carolina Biography*, *North Carolina Illustrated*, *North Carolina Through Four Centuries*, and the forthcoming Handbook, as well as other works now being written (e.g., new histories of women and African Americans in the state). Information gathered during the development of the pilot project will help anticipate the problems and project the resources needed for the larger effort.

Ei Reference Desk ™ -- The Electronic Library

John J. Regazzi, President
Engineering Information Inc.

At Engineering Information Inc. (Ei), we heard a clear new market need for the delivery of information and documents, and saw a variety of new technologies which would allow us to respond to those market needs. Such is the genesis of the *Ei Reference Desk*.

Currently the need has been for a single, comprehensive yet flexible means of accessing a broad range of information resource -- an electronic library. Ei has responded by developing a solution simple enough for the average library patron to use while at the same time sophisticated enough to meet the demands of the professional researcher.

It's called the *Ei Reference Desk*, and is an integrated software package designed to take full advantage of the powerful capabilities of today's desktop computers. Running under the Microsoft Windows environment, the *Ei Reference Desk* provides online access, offline CD-ROM searching, access to Ei's own *Table of Contents* service and the ability to capture orders for full-text documents from any of these three sources. Ei is then able to receive and fulfill those orders in a variety of ways.

The *Ei Reference Desk* currently support 386 and 486 processor based IBM and compatible personal computers. Each function of the *Reference Desk* has been implemented as a separate Windows application. This arrangement, together with the extensive application management features built into the Windows environment, gives the end-user a great deal of flexibility in choosing how to run the Reference Desk so as to best meet individual needs or preferences.

Provided the user's personal computer is equipped with an internal network connection to the Internet, Ei's databases and document delivery services may be remotely accessed using a Windows-based system. The multi-tasking capabilities of the Windows environment enables the *Reference Desk* to run the remote network application in the background. Thus, while awaiting the delivery of a document, a user has the advantage of simultaneously running other applications. Particularly significant is the ease with which any bibliographic record may be captured and passed to the order module should the user require the full-text of the cited document.

The versatility of the Windows environment allows a table of contents service called *Ei Page One* to be run in conjunction with the other Windows-based components of the *Ei Reference Desk*.

Ei is introducing the valuable new *Table of Contents* service under EiDisc, initially to be available exclusively through the *Ei Reference Desk*. This truly unique service is begin developed both to provide more timely access to the articles indexed and to extend the scope of material available to users.

The tables of contents from a significant portion of the approximately 5,000 journals and conferences abstracted at Ei each year will be reconstructed in an ASCII-based format. Ei will further augment the total number of titles available by scanning the contents pages from additional journals and conferences. Regardless of whether the table of contents for a particular title be displayed in ASCII or as a bit-mapped image, the user may order the full-text of any article on the page. The system will automatically generate an order record and pass it to the order module for any articles the user selects.

The order module is an integral component of the *Ei Reference Desk* and provides several important functions. This application enables the user to review any orders that have been captured from online and CD-ROM

searches or generated by the *Table of Contents* service. In addition a user has the option of entering a manual order by filling out an electronic order form displayed on the screen. Options to delete specific order records or to clear the entire file are also provided. After the items selected have been verified, the user need simple release the order file for transmission to Ei, at which point the system will automatically dial Ei's Document Delivery Service (EiDDS) and upload the order file via the modem.

Alternatively, the user may print out the order file and either fax, mail or even phone in the order to Ei, or to an interlibrary loan network. A customer profile is also maintained in the order module. Such important data as ship-to addresses, bill-to addresses, payment and delivery options are entered and easily modified by the user in this profile.

Delivery Options

Delivery options are as varied as are the ordering options. At the user's request, Ei can mail documents, send them via Federal Express, fax them or even optically scan them and transmit the resulting bit-mapping image files directly back to the user's computer via the Internet. This last option is accomplished through proprietary software which compresses and converts the image files so as to make them compatible with current transmission standards. Included in the *Reference Desk* is a special document display module which is designed to decompress and convert back the file so that the user may view it on the screen or print out a hard copy. The articles are scanned at 300 dpi and retain that resolution when printed by a laser printer.

The use of images by both the *Table of Contents* service and the document display components of the *Ei Reference Desk* is particularly well suited to the graphic nature of the Windows environment. As Windows applications, they make complete use of many sophisticated features such as zooming, re-sizing, or inverting images. The printing of whole or partial images is also supported. These advanced capabilities are possible using any monitors or printers supported by Windows.

Enhancements planned

With the *Ei Reference Desk* now completing beta-testing sites, a number of enhancements are already being planned. These include optional passwords on the various applications, particularly the EiDDS order module and access to online; detailed online help (beyond that already built into Windows); and computability with local and wide area networks.

The broad functionality of this new concept turns a personal computer into a personal information workstation. As each of the major components is a separate Windows application, the user may tailor its use to meet specific needs. The results from a local CD-ROM search may be automatically uploaded to a new order file while viewing documents received from a previous day's order. Pages from the *Table of Contents* service can be printed out for later perusal while the results of an online search are being passed to the order module. The number of scenarios is limited only by the number of potential users.

With general release of the *Ei Reference Desk* planned for 1994, anyone with a personal computer can soon put an electronic library on his or her desktop.

Stanford Computer Science Technical Reports Electronic Library Project

Vicky Reich
Chief, Serials & Acquisitions Department
Stanford University Library

Stanford University is participating in a consortial, ARPA funded ($1.5 million), 3 year project (1992 to 1995) to mount Computer Science Technical Reports on electronic networks. The project is coordinated by the Corporation for National Research Initiatives; other consortium members are: Massachusetts Institute of Technology; Carnegie Mellon University; University of California at Berkeley; and Cornell University. Within Stanford, this research project is a joint effort between the Libraries and Information Resources and the Computer Science Department.

Goals

The Consortium's goals can be summarized: build a networked electronic library of Computer Science literature; research technical issues; experiment with intellectual property systems; and document impact on scholarly community.

Stanford's research emphasis is to explore the problems of large distributed information systems; to experiment with issues of scale particularly as related to: selective dissemination of information; parallel text retrieval; distributed searching; and distributed indexes.

In addition, Stanford has spent the last year addressing some of the social and political aspects of intellectual property.

Intellectual Property (issues; solutions)

•Stanford needs author permissions to mount technical reports dated after 3/89; the project devised a form which allows non-exclusive, revocable rights to distribute the technical reports.

•Technical reports have multiple authors; Stanford's legal council advised that one author can give permission for multiple authors.

•Technical reports sometimes subsequently appear as journal articles; the project devised a form that authors can attach to publisher copyright agreements.

•Technical reports sometimes have previously appeared as doctoral thesis and UMI holds exclusive distribution rights; the project is not mounting these thesis. However beginning 1/1/94, UMI has a new agreement for Doctoral Thesis which gives UMI non-exclusive distribution rights for electronic editions.

•The project needed a working definition of a derivative works; investigators chose a conservative approach. If the title is similar and the authors are the same the works are considered to be derivative.

•Faculty have mixed understandings of copyright implications; a Computer Science faculty technical report committee was formed.

Subsequent Publication Study

An attempt was made to study subsequent publication patterns. The data below are not scientifically valid, but just hints at some patterns. In 114 of the returned permission forms authors indicated subsequent publication of their technical reports. The publisher distribution was:

IEEE	21.0%
Springer	10.5%
Elsevier	18.4%
SIAM	5.3%
ACM	18.4%
Academic Press	4.4%
Wiley	4.4%

Equipment and Database Size

•Scanning station- DEC PC 466; 32 mbytes memory; HP scanjet 2C
•Servers- RS6000, alpha
•Patron access station- MAC Centras 650; 500 mbytes
•Developer station- MacQuadra 800;1 gigabyte

The investigators have permission to mount approximately 1,500 technical reports; expected growth is up to 200 technical reports/year.

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SCAN:
Scholarship from California on the Net

Rebecca R. Simon
Assistant Journals Manager
University of California Press

Over the past year, the University of California Press has created a five-year plan to guide new electronic publishing efforts, focused on the development of both networked and stand-alone scholarly products for research and teaching purposes.

In line with this Plan, we have already begun a pilot networked project called SCAN (Scholarship from California on the Net) in which we are mounting two journals on the UC Berkeley Library's gopher server. This will be followed over the next two years by electronic dissemination of monographs in the same fields (19th century studies and classics) and by the addition of other monographs and journals. We have also begun work on several promising stand-alone projects, including two floppy disk and three potential CD-ROM projects.

The SCAN project is an institutionally-based partnership bringing together the Press, UC systemwide administration and the UC Berkeley library in a collaborative effort to publish humanities journals and potentially monographs on the Internet. In the pilot phase of this project, we are offering two journals, which we already publish in paper form -- *Nineteenth Century Literature* and *Classical Antiquity* -- in enhanced, electronic versions.

Our goals in this pilot project are to provide an easy to use, easily accessible, value-added electronic journal which we would be able to offer eventually on a cost recovery basis. We chose to work with the Library because this partnership would help us understand the needs of one of our primary customer bases better and provide the opportunity to work with them in exploring access, cost reduction and cost-recovery issues. Working with the Library also provides a valuable opportunity for alpha testing during which we will offer the electronic journals free in exchange for feedback from user and Library groups.

Currently, we have mounted *Nineteenth-Century Literature* on the UC Berkeley Library gopher server in ASCII and RTF (Rich Text Format) files along with a readme document. We decided to use ASCII as source files for indexed searches because the lack of formatting allows for easier on-line viewing. However, we also wanted to offer future subscribers RTF files which would preserve formatting that the greatest number of users could download.

We have learned a great deal in the process of creating this first stage product, experimenting in the process with file-naming, searchability and downloading. In the next phase of our project we will also explore, collaboratively with the Library, other platforms that will support our goal of cost-recovery publishing and image transmission on the Net. We will continue to maintain a presence in gopherspace, including mounting our Books in Print and Catalog there.

Third AAUP/ARL Symposium Explores Gateways, Gatekeepers, and Roles

(A Synopsis of the Conference)

Jinnie Y. Davis
Assistant University Librarian for Planning & Research
North Carolina State University

In the autumn of the year when the mass media discovered the information revolution, the third Association of Research Libraries/Association of American University Presses' joint symposium on Scholarly Publishing on the Electronic Networks was held in Washington, DC, from November 13 to 15, 1993. The meeting was also made possible through the collaboration of the University of Virginia Library and the National Science Foundation. Symposium Co-chairs were Ann Okerson of ARL and Lisa Freeman, University of Minnesota Press. Karen Marshall of the University of Virginia Library was chair for the Charlottesville session held on November 16th (see separate report on a "Day in the Village"). One-hundred sixty symposiasts, representing university presses, academic libraries, scholarly societies, and faculty, eagerly followed reports of new R&D and considered the significance and prospects of the growing cooperation between libraries and university press publishers. Excellent questions were raised, and some were even answered. Librarians and publishers found themselves in agreement on the need to understand the positions of both sides and to work together to resolve common problems.

Refining, Not Redefining

In her opening remarks, Lisa Freeman (Director, University of Minnesota Press) highlighted the leadership of ARL and AAUP for their visionary roles in seeking cooperation between academic libraries and university presses. She described the transition made by the university press directors from apprehension and confusion at the first Symposium in 1991, to their bolder posture at the current one, with presses ready to assume responsibility as full-fledged partners in the electronic world. Leadership is, she believes, the most important role the university presses can play in scholarly communication. Both libraries and university presses have a role in the current phase of refining -- and not redefining -- the issues.

The Library As Mind

Kaye Gapen (Library Director, Case Western Reserve University) demonstrated that the electronic learning environment is already a reality and her campus community is thinking, communicating, teaching, and researching differently. Digitization is the first necessary step for the electronic interchange of information; at CWRU it has been put to use as the beginning of a "knowledge management" environment. With a far-seeing university president and multi-million-dollar support, CWRU has installed a fiber-optic network throughout the campus. The library has applied Robert Taylor's "value-added model" as a planning and evaluation tool to identify where to shift budgetary support to provide more quality, adaptability, and savings in time and cost. It also interviewed 1,400 campus personnel to design a new system and develop the "virtual library" in which libraries are not information centers; rather, they bring people together with information in an integrated system of textual and image databases and provide them with online tools to build, maintain, and share databases. Infrastructures are changing to respond flexibly to shifting patterns of teaching and learning. New control mechanisms are also being sought: CWRU is

working with IBM to develop Royalty Manager software that helps track intellectual property rights. With two electronic classrooms and two centers for digitization, the library has expanded its role as information provider. No longer only "the library as place," Gapen visualizes "the library as mind."

The Virtual Library As Fantasy

James O'Donnell (Professor of Classics, University of Pennsylvania) traced origins of the term "virtual library" -- the fantasy of totality and readiness of access in existence since the days of the Alexandrian Library. While that ideal has never been realized, its utility lies in offering compass bearings for a short time. For centuries, it has been assumed that an author's works are fixed artifacts, the same wherever they may be found, and that the author can dictate worldwide use. In the networked, electronic environment, a variety of points of view exist on a single topic, producing not a single truth, but a complex, nuanced sense of what the truth may be. In the long term, a "book" cannot remain fixed but will live and be modified -- an idea unsettling to social institutions. O'Donnell likened the current situation to that of Western society in the fifteenth and sixteenth centuries, when the use of printing was denounced by critics concerned about the disappearance of the existing social order. He urged participants to strike a balance, to know when to use the "virtual model" as a guide and when to let go, and to be resourceful and creative to develop new kinds of cyberspace.

Do We Have the Vision?

Science-fiction author Bruce Sterling keynoted the Symposium with a speech in which he termed the electronic environment the "fastest technological transformation in human history." He cited Prodigy, with its proprietary, revenue-generating philosophy, as a prime example of how not to do networking. The network is a living thing which, like language, encourages people to communicate. Sterling conjured the specter of "Disney Bells" -- the alarming intrusion of the telecommunications and entertainment industries into the network. As for who should run the networks, his choice is librarians, who know where to put things, where they make sense; or universities, which have a set of values. After all, he mused, the academy was once Plato's user's group under an olive tree. Sterling concluded by observing that every ancient Greek text can now fit on a CD-ROM. Our civilization is fragile, but, with little effort, we can make sure that the human race never loses another word of the ancient Greeks. Such enterprise deserves the name of greatness, provided we have the vision.

What's To Be Done?

In a session devoted to the scholarly uses of technology, Eugene Vance (Professor of Humanities, University of Washington) compared today's world with the medieval one: a revival of fundamentalism in religions, holy wars, re-negotiation of gender models, and the culture of the book. Despite the continuing validity of medieval studies, funding cuts at university presses have led to their rejection of meritorious specialized works that do not sell well. For scholars, the crucial question is "What's to be done?"

Electronic Beowulf

A panel of medievalists then explored this question, beginning with Kevin Kiernan (Professor of English, University of Kentucky), with the first public announcement of the "Electronic Beowulf" project. By digitizing its manuscripts and applying special recovery techniques, the British Library will provide electronic access to priceless manuscripts in its collection. Through special lighting and enhancements, manuscripts that were damaged or erased in the original now come to view with startling clarity, opening up the way for new identifications and interpretations of text, as well as insight into the psychology of scribes. Kiernan warned, however, that these new techniques also easily lead to the possibility of electronic forgery.

Electronic Chaucer

Mary Wack (Professor of English, Washington State University) demonstrated her exciting prototype of an "Electronic Chaucer," which links a wide array of color image archives with associated text files. Spurred by the

inadequacies of traditional methods of teaching Chaucer, Wack linked a text searching and concordance program with the resources of the *Oxford English Dictionary*, *MLA Bibliography*, and *Art Index* to engage her students with a tool used interactively. Moreover, student assignments can result in portfolios of information that can then be added to the database. Despite its rousing success as a pedagogical tool, the project cannot be made publicly available because of copyright restrictions and software licensing issues. Wack believes, however, that the pressure of rising expectations will create changes -- the market is there.

No Way Around the Need to Choose

Michael Fuller (Associate Professor of Chinese Thought, University of California at Irvine) drew an analogy between the current situation and that of China in 1200 A.D. With block printing supported by both the government and a thriving commercial printing and distribution industry, China had access to almost all of its textual legacy and faced similar problems of the organization of "infoglut." The meritocracy arising in the Song Dynasty led to a time of heady intellectual egalitarianism based on the ready availability of all texts. It also led, however, to partisan wrangling based on different interpretations of the past: the faction with the most compelling version of the past could claim it, and claim understanding of the present and of the future. The turmoil ended with the establishment by Zhu Xi of a coherent orthodoxy out of the previous cacophony. In doing so, however, Zhu Xi elevated some texts and suppressed others, forming a new framework within which Chinese literature evolved for the next 700 years; only now are scholars realizing what has been lost. In the electronic age, we are similarly faced with the need to select texts with some priority because of the constraints of time and resources. There is no way around the need to choose -- but by selecting, we are also suppressing. We must, therefore, reject a process that hides the selections being made.

Gatekeeper to a Garden of Earthly Delights

David Seaman (Coordinator, Electronic Text Center, University of Virginia Library) described the Library's Electronic Text Center. It offers not only the text themselves, but also scanners and software that compares text and generates word lists. The electronic library contains thousands of full-text documents in the humanities, arranged by language and type of resource (electronic or not). Although most commercial databases in the humanities are already encoded with SGML, library staff has also encoded many additional, commercially unavailable texts in the public domain, to expand holdings. Seaman described UVA's philosophy as one of "if you build it, they will come": humanists have been involved in the project since its inception and are finding far more teaching uses for the system than they had imagined. It has also drawn library staff into new collaborative roles with the faculty.

The Gods Walk the Earth

Joseph J. Esposito (President, Encyclopaedia Britannica Publishing Group) updated the status of the electronic version of the Encyclopeadia, in an environment he characterizes as "entirely destabilized, . . . the gods walk the earth, and mere mortals must stay out of the way or be crushed underfoot." By next fall, *EB Online* will be available on campus terminals, in text form only. Survey results showed that academics were prepared to wait for graphics but wanted to have online text immediately; the level of sophistication in academia was far beyond what EB imagined. Although Esposito said at last year's symposium that he did not see a role for the Internet in this project, the prohibitive cost of installing the database at individual local sites led EB to the Internet, which allows them to develop the product once, then sell subscriptions to colleges with access. EB sees this as an opportunity to drive the prices for information down and pass the savings along to clients. Another fundamental change is that, for the first time, the EB will no longer be a literary artifact but a knowledge base taking an actual form whenever a particular marketing application arises, a notion unsettling to some board members and sales personnel. EB is also working on the application of artificial intelligence to experiment with neural network software, leading to questions of what these changes in the medium mean for knowledge itself.

Lasting Investment in Content

Michael Ester (President, Luna Imaging, Inc.) described the Getty Art History Project, which is studying how art historians, curators, catalogers, and other professionals use images in their work today to ensure the development of a usable product that can transform manual activities in the electronic environment. Survey and interview results revealed a range of issues, including the need to display works of art in physical juxtaposition in a way that makes it possible to compare their actual scale; the unexpected finding that colors accurate in a smaller size seem wrong when magnified on a large monitor; the desire to place a work of art in its actual context or location; and changing needs in terms of reproduction quantity and quality, depending on the particular phase of research. Ester considers much of today's multimedia still "uni-media," that is, the user is not searching through more resources, just through a database to which video or audio clips have been attached. Despite rich navigational aids in the online environment, the user has no intuitive sense, as with a physical volume, of how much information is available in a database. In his new position with Luna Imaging, Ester is committed to the production of archival-quality images; although the technology will change, the content needs lasting investment.

Wisdom, Not Information

Colin Day (Director, University of Michigan Press and current President of the AAUP) focused on appropriateness of market solutions to the problems of academic publishing. Day sees librarians and university press publishers as intermediaries whose work saves the time of the reader and adds value to public goods. These public goods, however, are inadequately supplied. They are non-exhaustible and non-excludable, leading to a situation in which some documents that should be published are not. As an alternative organizational structure, Day proposes "mutualization." That is, if university presses, librarians, and faculty recognize that they are part of the same organization, they can work together to address current problems such as publishers' worries about cost recovery and librarians' concerns about increasing prices. Day observed that the term "information" distorts the subject and leads to unhelpful models; he suggested the use of the word "wisdom" instead. He urged participants never to lose sight of the major issue -- the freedom of ideas, and the sustenance and transmission of our culture.

Creating a Culture of Lifelong Learners

Despite the title of his talk, "Security, Authoritative Versions & Privacy", Michael Jensen (Electronic Media Manager, University of Nebraska Press) took the stance that heavy-duty protection in the electronic network may be unnecessary. Limitations by user or machine make it difficult to obtain information and can lead to the view that educational information is a commodity to be consumed and jealously guarded. Rather, those in the not-for-profit sector should shift assumptions and view the interconnectivity of the network as its strength, allowing a mixture of people and ideas that fosters curiosity, discovery, and investigation. The new medium offers the possibility to rethink the traditional process of publishing, with its ideas of exclusive ownership and sales of a "unit." A potential model might be like a web in which renting transactions are more prevalent than sales. If service comes first, the role of university presses is to provide the best information in the most integrated fashion. A consortial effort on the part of university presses is needed to begin serious discussion of models of free interconnectivity that still retain peer-reviewed quality and allow cost-recovery via other means such as multiple repackaging for users. The focus must be on the primary goal of service to the community.

A Northwest Passage to the Intellectual World

David Blair (Associate Professor of Computer and Information Systems, University of Michigan) addressed the issue of intellectual access on the networks. Sheer size poses enormous difficulties in both physical and intellectual access, given the coarseness of the tools now available. He suggests that effective searching tools must be able to describe accurately the intellectual content of the information they represent, to distinguish content from that of similar but different items, and to retrieve a small enough number of items that the user can examine them without

reaching a "futility point." The key to intellectual access on a large text-retrieval system is through the description of intellectual content and the precise delineation of a partition, or a definable region in search space. Publishers should help by describing the kinds of materials they publish and defining clearly their publishing policies. It will not be easy to improve intellectual access, but it is necessary; a "Northwest Passage," like the geographical one, may be a vision, but it will improve our lives.

Getting through the Fire Walls

John Regazzi (President, EI Inc.) demonstrated the Engineering Information Reference Desk project. EI produces indexing and abstracting works such as *Engineering Index* and *Compendex Plus*. Although EI produces CD-ROMs, research libraries had been asking for broader accessibility particularly to EI's vast collection of journal and conference literature whose richness and value is currently unavailable to users because of the prohibitive cost of attempting to abstract it. The EI Reference Desk attempts to organize this previously unindexed literature and make it accessible through the Internet. Its three applications are: EI Page One (a tool to browse through the table of contents of EI reference works), EI Order (an electronic ordering tool), and EIView (to receive data over the Internet and print it). For libraries, a feature to be added next year is the ability to link local holdings to this database. Problems encountered include the need to get through "fire walls" (built-in protection for data moving in and out of an organization via the Internet) and the need to accommodate in system design the vagaries of the actual work habits of their users.

Our Future is Interlocked

Peter Givler's (Director, Ohio State University Press) fundamental premise is that copyright issues affect everyone and the best hope of solving the problems is for librarians, scholars, and publishers to work together. Givler explained that copyright protects forms of expression -- not ideas or facts themselves, but ways to communicate something whose reality is independent of form. To many academics, copyright seems to be a morally questionable restriction that runs counter to the ideal of university life in which scholars are dedicated to a search for truth. Moreover, it pits the rights of publishers and authors against the rights of libraries and users. It is, however, still the law of the land and grants a monopoly on information to copyright-holders. As the cost of information has risen more quickly than inflation or library budgets, librarians and patrons have become locked in a struggle to free themselves from this monopoly. Givler places the blame not on the copyright law itself, but on those who abuse it. He considers copyright a law that recognizes ownership by creative people of work they create, while providing a flexible legal framework for dissemination of the work. The system works because, by establishing ownership, copyright permits the publisher a reasonable chance of recovering costs of publication. Givler warned that, with unregulated dissemination, university presses will be out of the business of scholarly communication. The university community should explore promising avenues for resolution -- for example, by designing special licenses for specific purposes -- such as blanket licenses for a group of electronic journals -- that balance the rights of publishers, users, and libraries. Givler called for university presses and libraries to work together to find solutions to this intractable problem. We are all part of the same institutions and share the same goals; our future is interlocked.

Non-Profit Publishers Are Suffering

Janet Fisher (Associate Director for Journals Publishing, MIT Press) warned that the movement led by libraries to encourage authors to limit rights to commercial publishers is hurting the non-profit publishers as well and has the potential to destroy the system of scholarly communication built up over the years. In the electronic environment, serious problems arise with regard to the loss of access to information. Fisher focused on an explanation of how the licensing of subsidiary rights in a journal environment works and outlined the responsibilities of the press in this area. When authors transfer rights to the publisher, the publisher gives authors the right to reuse their own materials and, in addition, handles copyright registration, depository copies, questions from photocopy

shops, reprints, translations, audio versions, and publications by secondary publishers, including the increasingly important arenas of CD-ROMs and online databases. Fisher believes that it is critical for publishers to be able to handle all these matters coherently. Without such centralization of ownership and the permissions process, the negotiation of contracts for each work would be an extremely time-consuming process that authors will not wish to handle for themselves. Publishers also fulfill an important role as a focal point for determining the content of a journal; without publishers, the availability of products to secondary publishers would be time-delayed and more expensive because of the need to consider each article individually and to negotiate rights for each with the author or institution. There is, however, room for compromise. When authors wish to retain copyright, the publisher should have other options available to license subsidiary rights that would not deter dissemination. Other possibilities include allowing authors to copy articles for use in their own classrooms or to shorten the length of time needed for exclusive rights, particularly in the electronic environment. Publishers should also do a better job of explaining to authors what the purpose of subsidiary rights, including the benefits for authors and the scholarly community. Fisher warned that current calls by librarians for a more aggressive stance on fair use will affect librarians in the end, as well as hurting nonprofit publishers more than commercial publishers. She called for university presses and libraries to work together to develop desperately needed guidelines for fair use in the rapidly developing electronic environment.

Getting Our Acts Together

Isabella Hinds (Manager of Professional Relations, Copyright Clearance Center) noted that the copyright law has tolerated changes over the years; the question is not whether copyright is reasonable, but whether those charged with carrying it out are reasonable. Her talk focused on blanket collective licenses and how they can further scholarly communication. The Copyright Clearance Center (CCC) is a non-profit organization established fifteen years ago by a consortium of publishers, authors, and users as a clearing-house to facilitate the exchange of rights and royalties. Legally, it serves as an agent for about 8,600 publishers worldwide. The CCC ensures the end user access to a large body of material, and distributes millions of dollars in royalties each year. It has experimented with collective licenses at six universities, whereby they pay an annual fee for the CCC to offer a repertoire of publications for their use. Hinds believes that collective licensing can give both the institution and the end user access to a constantly expanding body of literature, while ensuring the protection of copyright interests of authors and publishers. The electronic future will outpace our ability to define and measure ways of use; collective licenses hedge against these bets; a good collective license will also cover fair use. Hinds warned against setting up an overly complicated process that costs more than it is worth and will not prevent abuses. She urged all sides to get their acts together and to agree on a statement of their concerns, before negotiating with other stakeholder groups. A consensus is needed on how to solve existing problems, and Hinds concluded, "Don't let the lawyers solve it for us."

Why Are There Still Lines at the Teller Windows?

David Hoekema (Dean, Calvin College) reviewed the needs of scholars and what the computer can provide for them. According to Hoekema, scholars are a very traditional group of people who just want to do more effectively what they are doing now; the computer allows them to discover new working methods that can save their time. A possible change in the patterns of scholarship may result. For example, browsing among the bookshelves may be replaced by browsing among a gopher's electronic shelves, leading to different paths of discovery. As for librarians, Hoekema believes that, while routine help may be handled by machines, there will still be a need for the interpretive, evaluative, guidance skills of library professionals; patrons will still line up at the teller windows because not every transaction can be handled by the machine.

A final panel of reactors shared their insights with symposium participants. Georgia Harper (Counsel, University of Texas System) encouraged attendees to free their minds from

old constructs and think in new ways to resolve problems by working together. We have the possibility, she noted, to make an evolutionary jump. Duane Webster (Executive Director, ARL) described two recent events that attest to current commitment to resolve problems: the creation of the Telecommunications Policy Roundtable to ensure a public voice in the emerging national information infrastructure, and the establishment of the National Information Infrastructure Working Group on Intellectual Property. ARL and other organizations will have an opportunity to present the library point of view at a public hearing. Mary Coleman (Yale University Press) noted the resistance to technology felt by many university press representatives at the first symposium. Now, she feels a greater level of comfort with the lingo, a great deal of progress on gopher-based projects, and a willingness to find ways to make information available to people. Bruce Barton (University of Chicago Press) also contrasted the first symposium and the current one: at the former, university presses were overwhelmed by large-scale projects such as OCLC's journal *Online Clinical Trials* and unsure if they could enter the electronic marketplace. Now, electronic publishing is being integrated into the mainstream; there are sophisticated products within the grasp of university presses. The challenge in the next ten years is to guarantee access to electronic products.

The topical panels were spiced by a number of brief project demonstrations including an interactive Supreme Court demo (Jeff Goldman, Northwestern University), Encyclopaedia Britannica Fact Checker (Doug Paul, EB), electronic journals projects (Scott Bennett, Johns Hopkins University and Rebecca Simon, University of California Press), Project Janus (Kent McKeever, Columbia University Law Library), National Museum of American Art Online (Steve Dietz), the North Carolina Reference Collection (David Perry, UNC Press), Stanford's participation in the DARPA technical reports project (Vicky Reich), and Chuck Creesy of Princeton University Press on the development of university press Internet catalogs via gopher access.

[ED. Note: Notes from Lisa Bayer, Penn State University Press and Ann Okerson, ARL, were incorporated into this summary.]

University of Virginia
A Day in the Electronic Academical Village: All in a Day's Work in the Digital Library

Karen Marshall, Reference Librarian
Alderman Library, University of Virginia

A special excursion after the recent AAUP/ARL Symposium brought 40 participants to the University of Virginia Library to see electronic publications conveyed to faculty and students and to focus on the emergent digital library and new forms of scholarly publication. After addresses by Karin Wittenborg, University Librarian, and Edward Ayers, Professor of History, who is currently creating an electronic archive of the life of two American towns in the Civil War era, participants visited the Library's electronic resource centers to examine different types of information routinely delivered over the local and global networks.

Electronic Text Center

David Seaman, Center Coordinator, showed the on-line SGML text collections and the search software through which they are accessed, as well as the text-analysis programs, scanning technology, and digital image manipulation software available to library users.

GIS (Geographic Information Systems)

Paul Bergen, Social Sciences Data Center Coordinator, introduced geographic information systems and drew on some research projects performed in the GIS Lab. Participants saw satellite imagery of Charlottesville linked to 1990 Census maps, and analyzed Civil War battle strategy using a three-dimensional digital elevation model of the mountains around Stokesville, Virginia.

Images

Christie Stephenson, Digital Image Center Coordinator, showed off the Digital Image Study Project, a pilot project to provide images to students in art and architecture history survey courses. In addition, participants saw an electronic exhibit catalog she created to document a recent exhibition of African Art at UVA's Bayly Museum. The Catalog was presented using the NCSA Mosaic client for the World Wide Web.

Electronic Classroom

James Campbell, Chair, Electronic Information Committee, Michael Plunkett, Curator of Manuscripts, and John Price-Wilkin, Systems Librarian for Information Services, presented the possibilities and problems of supplying information over the University networks. VIRGO, the Library's catalog and bibliographic database system, and the CD-ROM databases were discussed in terms of funding and staffing. The Library's most ambitious Gopher project -- mounting its Special Collections guides -- was described and demonstrated. WAIS technology searched manuscript collections dealing with slavery.

Institute for Advanced Technology in the Humanities

John Unsworth, Director, and Thornton Staples, Associate Director, described the IBM grant that initiated it, and the fellowship program that brings UVA humanities scholars into the Institute. John Dobbins, Art Department faculty and current Institute Fellow, discussed his reconstruction of the forum at Pompeii. Another Fellow, Hoyt Duggan, English Department, presented his project to build an electronic archive of the manuscripts of *Piers Plowman*. Some hypertext projects using the World Wide Web were demonstrated, including former Fellow Jerome McGann's Rossetti Archive.

Politics and Financing of Electronic Centers

Kendon Stubbs, Associate University Librarian, presented a session on the evolution of the Electronic Text Center at the University of Virginia.

Cataloging and Organization of Electronic Materials

Edward Gaynor, Head of Original Cataloging, discussed the use of TEI P(2)- conformant SGML to create full bibliographic headers for electronic texts. He outlined the decision-making process involved in selecting elements to be included in the file description and organization. He also demonstrated the online workform for the bibliographic headers, the fully parsed text, and the text plus headers. The need for a MARC record to represent the text both in the Library's catalog, and the national utilities was discussed. Visitors viewed the manual conversion of the header to MARC format and heard about plans for an automated translation program. The session concluded with a general discussion on the need for "super- catalogs" and multi-level catalogs that could incorporate full-texts, standardized access points, and a bibliographic place holder (a.k.a. the MARC record).

[ED. Note: This report was assembled from notes by the presenters of the sessions described above.]

Association of Research Libraries
Association of American University Presses

In Collaboration With:

The University of Virginia Library
The National Science Foundation

SCHOLARLY PUBLISHING ON THE ELECTRONIC NETWORKS

Gateways, Gatekeepers, and Roles in the Information Omniverse

Electronic Publishing Issues
Demonstrations
Experiments
Copyright

November 13-15, 1993
The Washington Vista Hotel
Washington, DC

November 16, 1993
University of Virginia Library
Charlottesville, VA

Scholarly Publishing on the Electronic Networks: Gateways, Gatekeepers, and Roles in the Information Omniverse

This three-day symposium is specifically aimed at university presses, learned and professional society publishers, librarians, and academic faculty and researchers interested in beginning electronic publications. The Symposium's objective is to promote information-sharing and discussion among people interested in developing the potential of the networks, particularly for formal scholarly electronic publishing, with particular emphasis on not-for-profit models. Presenters will discuss some of the latest research and development from the not-for-profit sector, including faculty, societies, publishers, and libraries.

E-mail address for Inquiries: symposium@e-math.ams.org
Co-chairs: Lisa Freeman, University of Minnesota Press (lfreeman@staff.tc.umn.edu)
Karen Marshall, University of Virginia (kkm7m@poe.acc.virginia.edu)
Ann Okerson, Association of Research Libraries (ann@cni.org)
Association of American University Presses Planning Committee

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Daily Schedule of Events

Day 1

Saturday, November 13th

4:00 - 6:30 p.m. OPENING SESSION

Opening Remarks and Welcome
- Lisa Freeman, Director, University of Minnesota Press

"Scholarly Communications: Gatekeepers and Roles"
- D. Kaye Gapen, Library Director, Case Western Reserve University

"The Virtual Library: An Idea Whose Time Has Passed"
- Jame J. O'Donnell, Classics Department, University of Pennsylvania (includes Alain Resnais' film, "Toute La Memoire du Monde")

KEYNOTE ADDRESS: "We're All in This Together — Aren't We?"
- Bruce Sterling, Science Fiction Writer and Journalist

6:30 - 7:30 p.m. Opening Reception

Day 2

Sunday, November 14th

8:45 a.m. - 12:00 noon MORNING SESSION

"Electronic Library Issues and Strategies"
- David Seaman, Coordinator, Electronic Text Center, University of Virginia Library

PANEL: Historical Visions and Modern Revisions of Virtual Knowledge
- Convener: Eugene Vance, Lockwood Professor in the Humanities, University of Washington

"Digital Preservation, Restoration, and Dissemination of Medieval Manuscripts"
- Kevin Kiernan, Professor of English, University of Kentucky

"Chaucer in 2001"
- Mary Wack, Chairman of the English Department, Washington State University

"Gatekeepers of Memory: Issues in the Chinese Efforts to Organize Their Textual Legacy"
- Michael A. Fuller, Chiang Chin-kuo Associate Professor of Chinese Thought, University of California, Irvine

12:00 - 1:30 p.m. Buffet Lunch Provided

2:00 - 5:00 p.m. AFTERNOON SESSION

Issues in Publishing and Economics: Serving the Electronic Academic Market

"Image Representations, Issues, and Strategies"
- Michael Ester, Director, Getty Art History Project

"Economic Considerations"
- Colin Day, Director, University of Michigan Press

"Security, Authoritative Versions, Privacy"
- Michael Jensen, Electronic Media Manager, University of Nebraska Press

"But Will It Scale UP?"
- David Blair, Associate Professor of Computer and Information Systems, University of Michigan

(Dinner on your own, organized into groups and topics)

Day 3

Monday, November 15th

"Engineering Information Issues & Strategies"
- John Regazzi, President, Engineering Information, Inc.

PANEL: Copyright, Ownership, and Intellectual Property

"Role of Subsidiary Licenses in the Dissemination of Scholarly Research"
- Janet Fisher, Associate Director for Journals Publishing, MIT Press

"Licensing Issues in the University Environment"
- Isabella Hinds, Manager of Professional Relations, Copyright Clearance Center

"Copyright: Some Theoretical and Practical Considerations"
- Peter Givler, Director, The Ohio State University Press

12:00 - 1:30 p.m. Group Lunch Provided

1:30 - 3:00 p.m. CLOSING AND SUMMARY SESSION

"A Moveable Feast? Campus Information Roles and Issues"
- David Hoekema, Dean, Calvin College

"Frontiers of Inspiration"
- Bettie Alexander Steiger, Principal, Technology and Market Development, Xerox Parc, Palo Alto

3:30 p.m. Bus leaves the Vista for Charlottesville

Day 4

University of Virginia Electronic Academical Village

Monday, November 15th

6:00 p.m. Arrive Charlottesville (Howard Johnson Lodge) and check in

7:00 - 9:00 p.m. Dinner provided, with welcome from University Librarian; overview by Village Staff

Tuesday, November 16th

8:30 a.m. - 12:15 p.m. Four concurrent 45-minute sessions, with groups of 10 participants
(1) Electronic Text Center
(2) GIS (geographic information systems)
(3) Images
(4) Classroom Applications

12:15 - 1:15 p.m. Box lunch provided

1:30 - 3:15 p.m. Choose two out of four options:
(1) Institute for Advanced Technology
(2) Cataloging and Organization of Electronic Materials
(3) Politics and Financing of Electronic Centers
(4) Free Time

3:30 p.m. Board bus for return trip to Washington, DC

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Scholarly Publishing on the Electronic Networks, 1993

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